

**PROFINET**  
**The leading**  
**Industrial**  
**Ethernet**  
**Standard**



**The Benefits of**  
**PROFINET**

## Agenda

Uniform  
structures

Performance

Integration

Innovations

Enhancement

## PROFINET offers ...

**... more continuity and uniform structures**

**... more nodes and better performance**

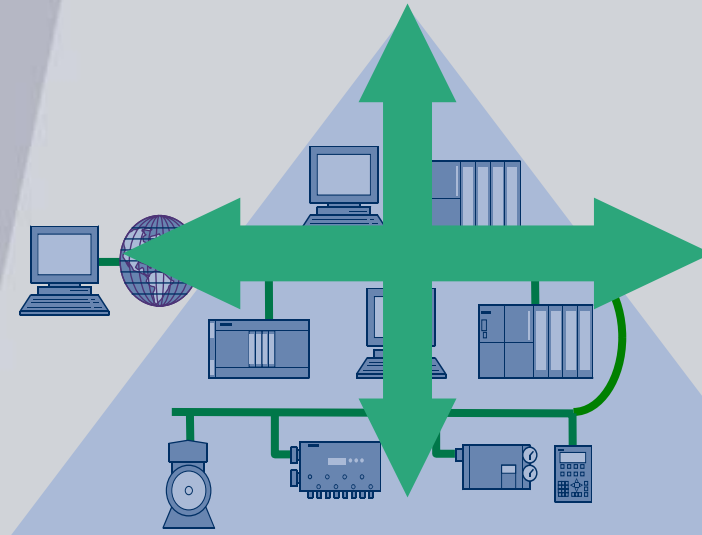
**... seamless integration of existing systems**

**... new, innovative applications**

**... continuous enhancements**

**PROFINET  
offers ...**

**... more  
continuity  
(uniform  
structures)**



In communication

## Agenda

Uniform structures

Performance

Integration

Innovations

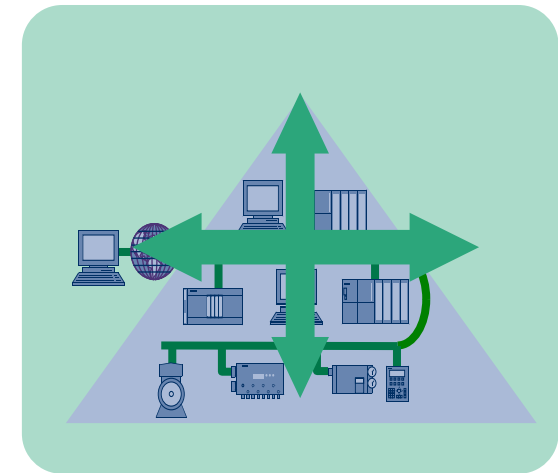
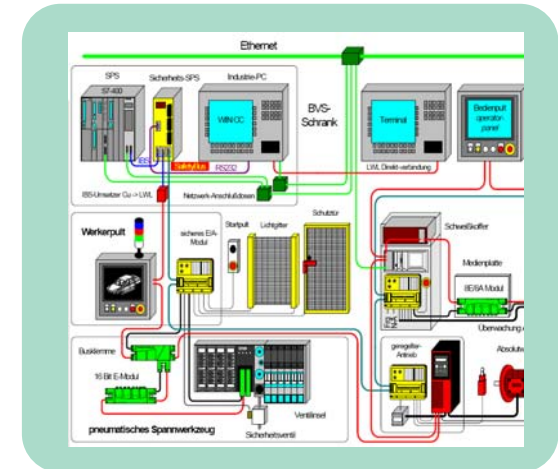
Enhancement

## Does this sound familiar?

- Different networks in your office and production areas
- Several individual proprietary solutions
- Diagnostics, service and maintenance only possible on site and is long and involved

## Your requirements

- Uniform, safe and secure networks without any network transitions
- Uniformity and reliability based on accepted standards
- Plant-wide, uniform engineering
- Access, service and maintenance from anywhere



**Goal: To cut the cost of engineering, commissioning and live operation**

## Agenda

Uniform structures

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## Based on ...

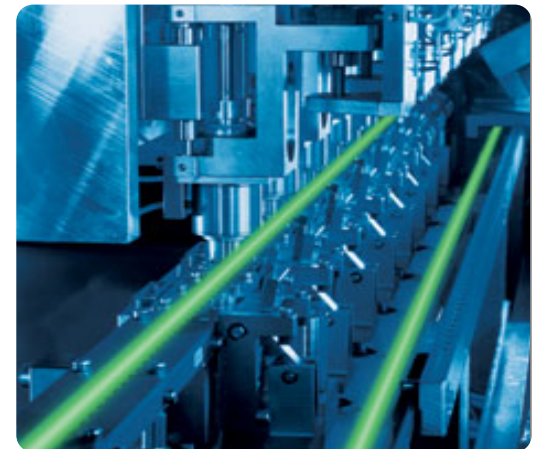
- Standard Ethernet
- Real-time communications

## ... and advanced architecture

- Just one bus for everything
- Flexible network topologies

## results to

- Unlimited IT communications parallel to real-time communications
- Easy use and integration of standard Ethernet applications
- Web functionalities in automation components
- Security even in your industrial environment



Agenda

Uniform structures

Performance

Integration

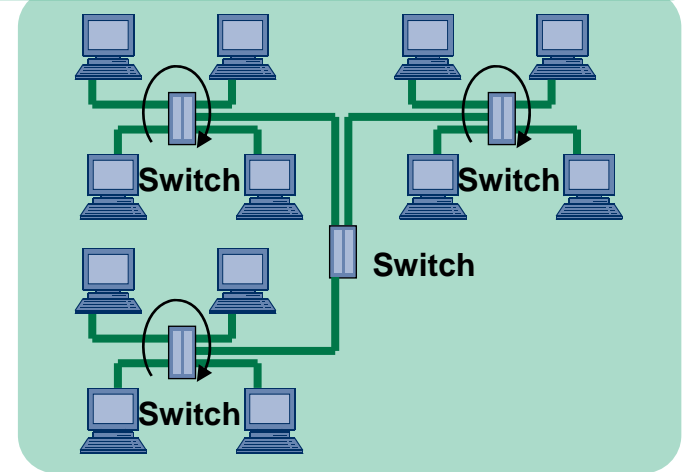
Innovations

Enhancement

## Switching technology

- Simultaneous sending/receiving
- Parallel communications paths
- Unlimited number of devices
- Ultra short response times
- 1,440 bytes per frame

### Parallel communications



**PROFINET – innovative and future-proof**

Agenda

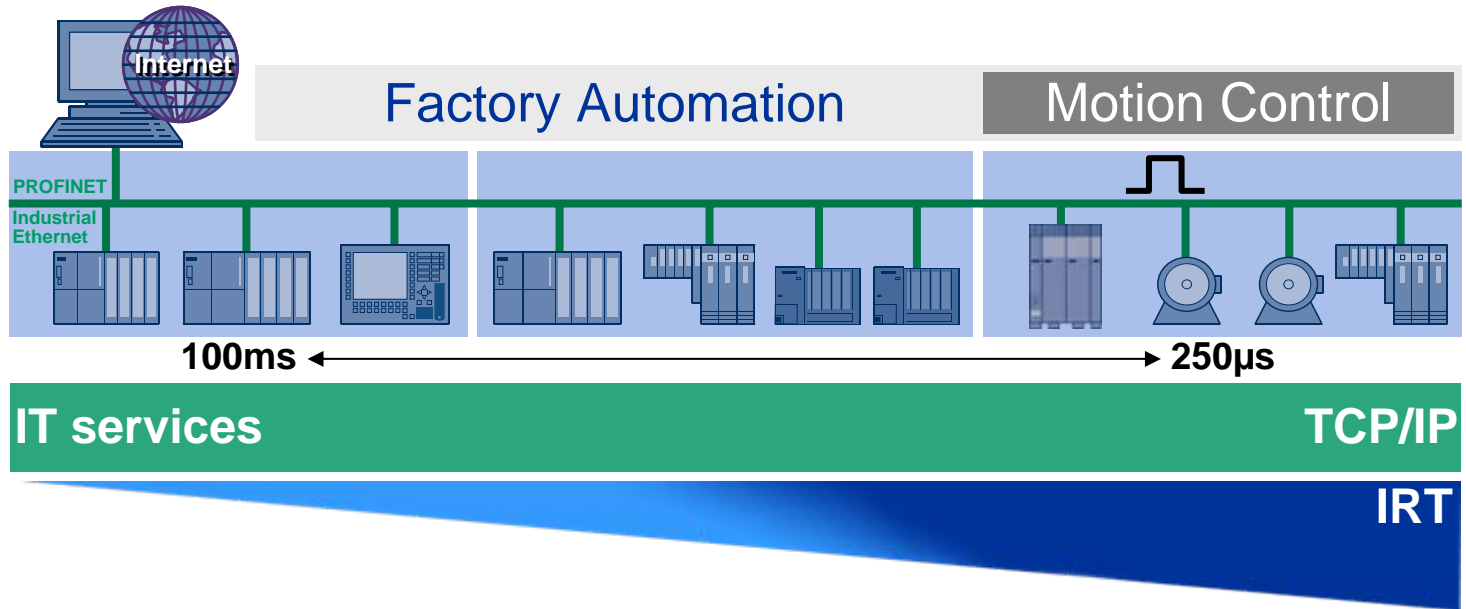
Uniform structures

Performance

Integration

Innovations

Enhancement



Enables all this...

- ... direct online access to field devices
- ... maintenance and service from anywhere (even remote)
- ... lower costs for production/quality data monitoring

**Scalable Real-time for simultaneous, unlimited IT communications**

## Agenda

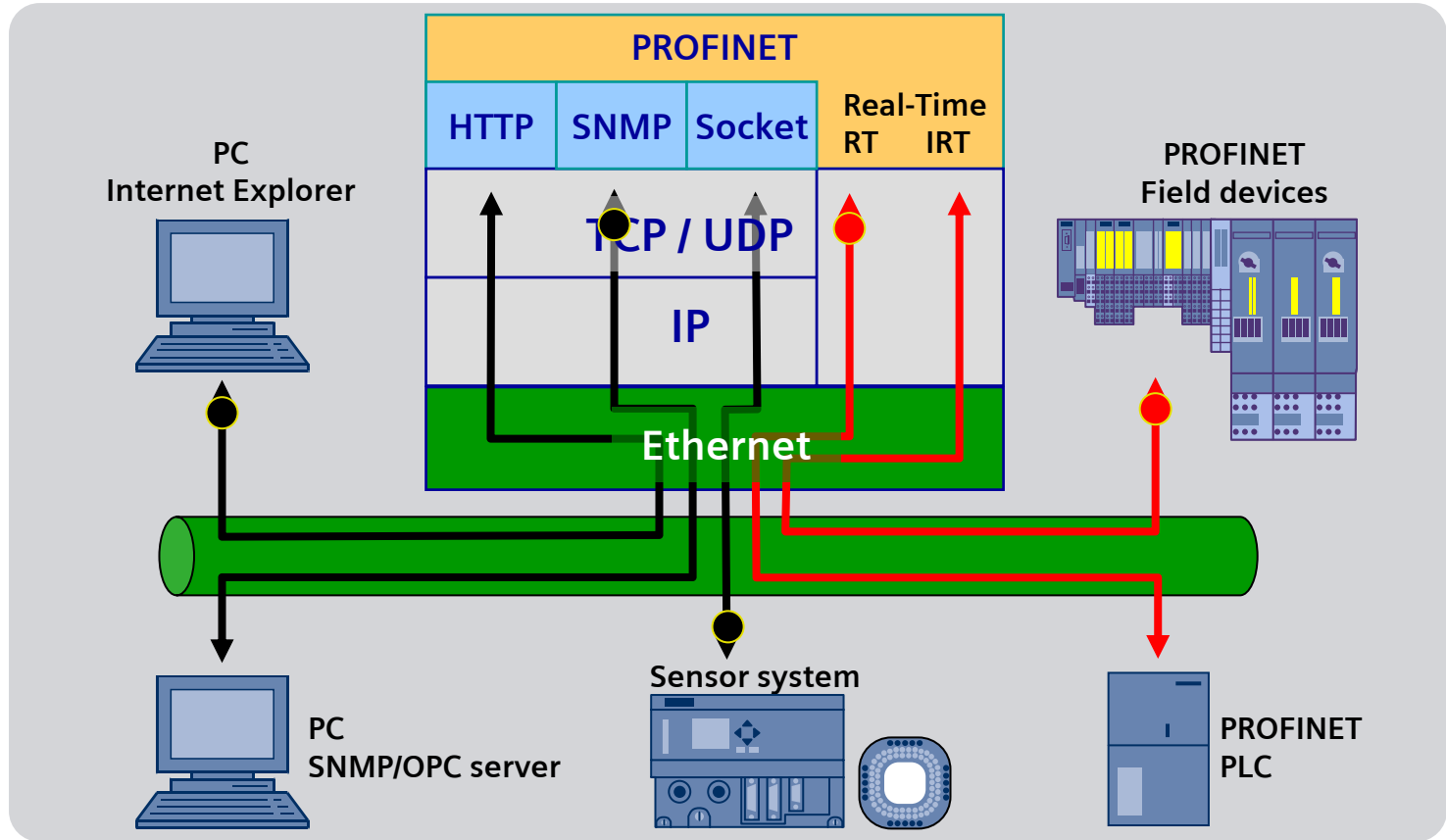
Uniform structures

Performance

Integration

Innovations

Enhancement



**PROFINET features standard TCP/IP communications in compliance with IEEE 802.3 and real-time communications**



Agenda

Uniform structures

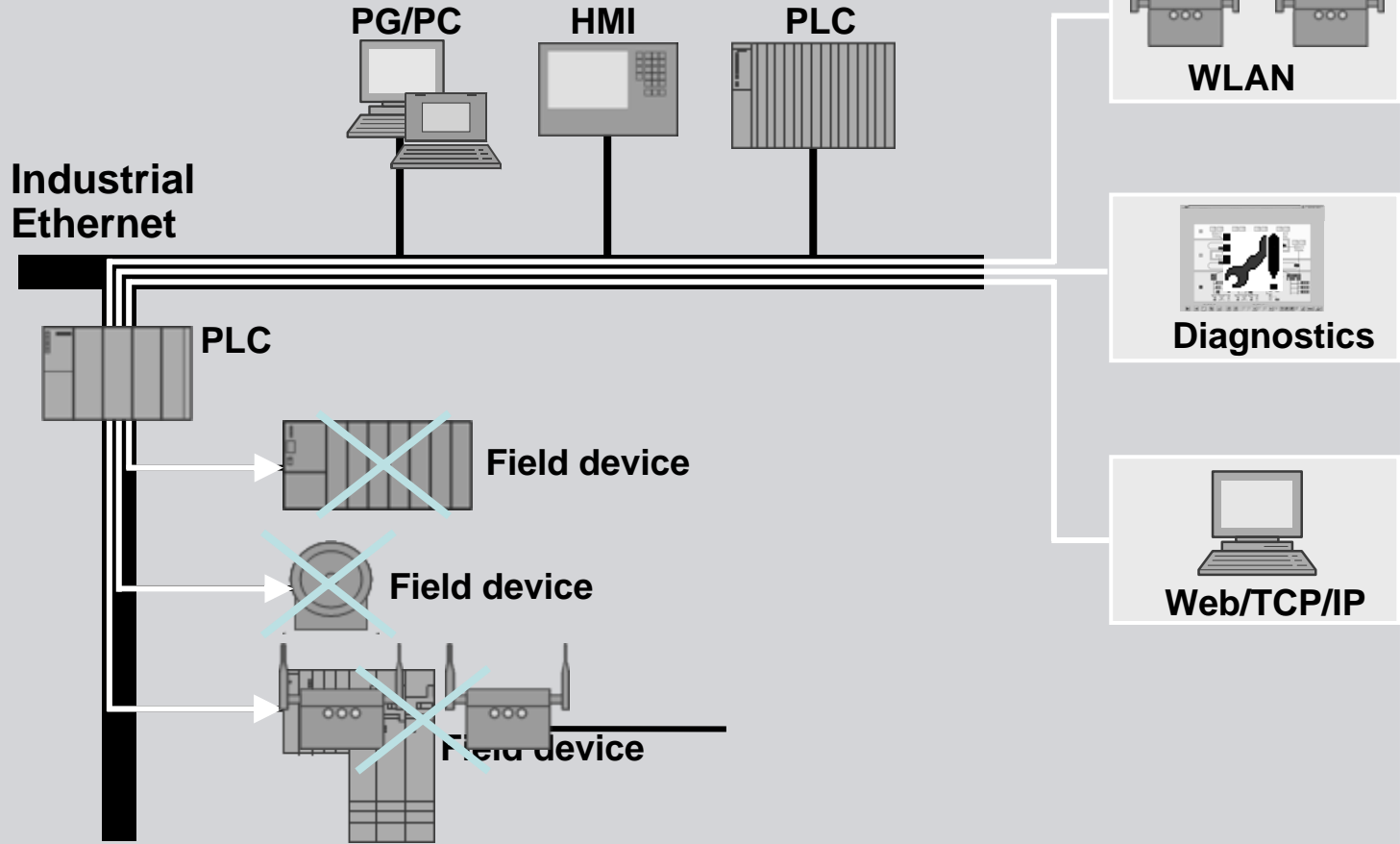
Performance

Integration

Innovations

Enhancement

## Conventional automation topologies with fieldbuses such as EtherCAT, Ethernet Powerlink, PROFIBUS and other



Agenda

Uniform structures

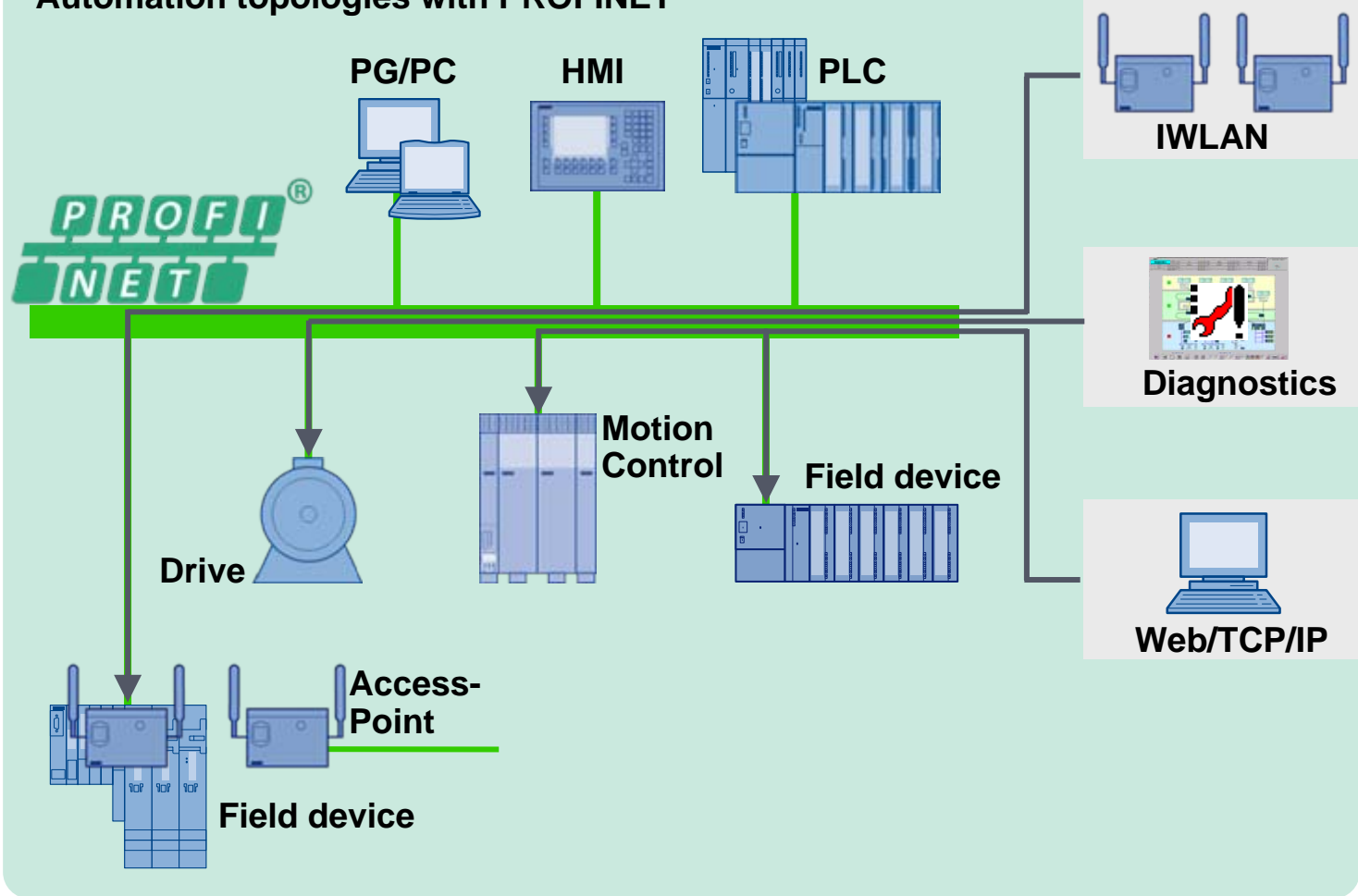
Performance

Integration

Innovations

Enhancement

## Automation topologies with PROFINET



## Agenda

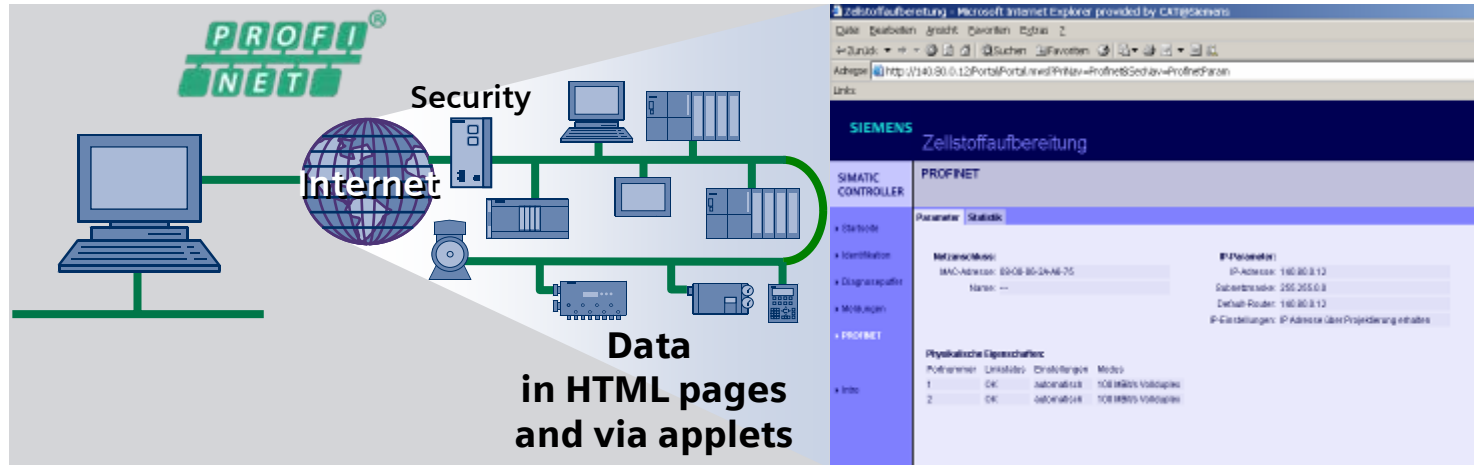
Uniform structures

Performance

Integration

Innovations

Enhancement



Access to the automation from anywhere in the world

- Via the integrated web server in automation devices
- With a standard Internet browser
- Regardless of your engineering tool
- Easy remote diagnosis and services

Event-driven message dispatched by SMS or e-mail

**PROFINET - innovative communications via TCP/IP and the Internet for automation applications, too!**

Agenda

Uniform structures

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Innovations

Enhancement

Offers protection from

- Address errors and improper operation
- Unauthorized access
- Manipulation and espionage

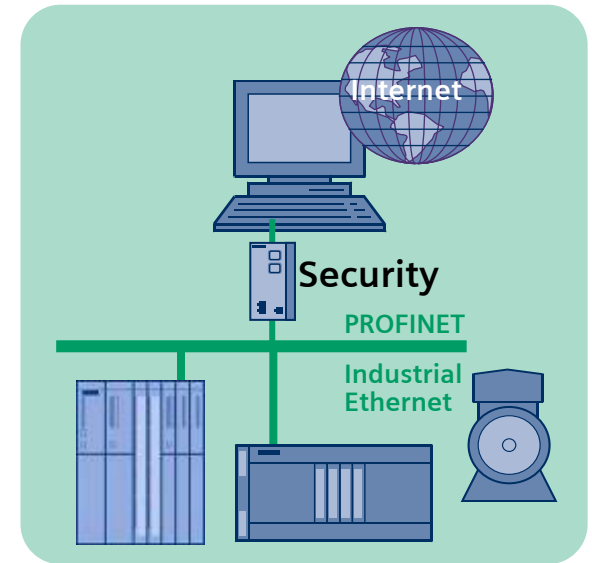
Features

- Scalability and reaction-free installation
- Only basic IT knowledge required
- Proven and certified security standards (firewall, VPN)

Enables

- Use of Ethernet at all levels of automation
- Vertical networking
- Increased use of open IT standards in automation

**Boost security and performance in your production processes!**



## Agenda

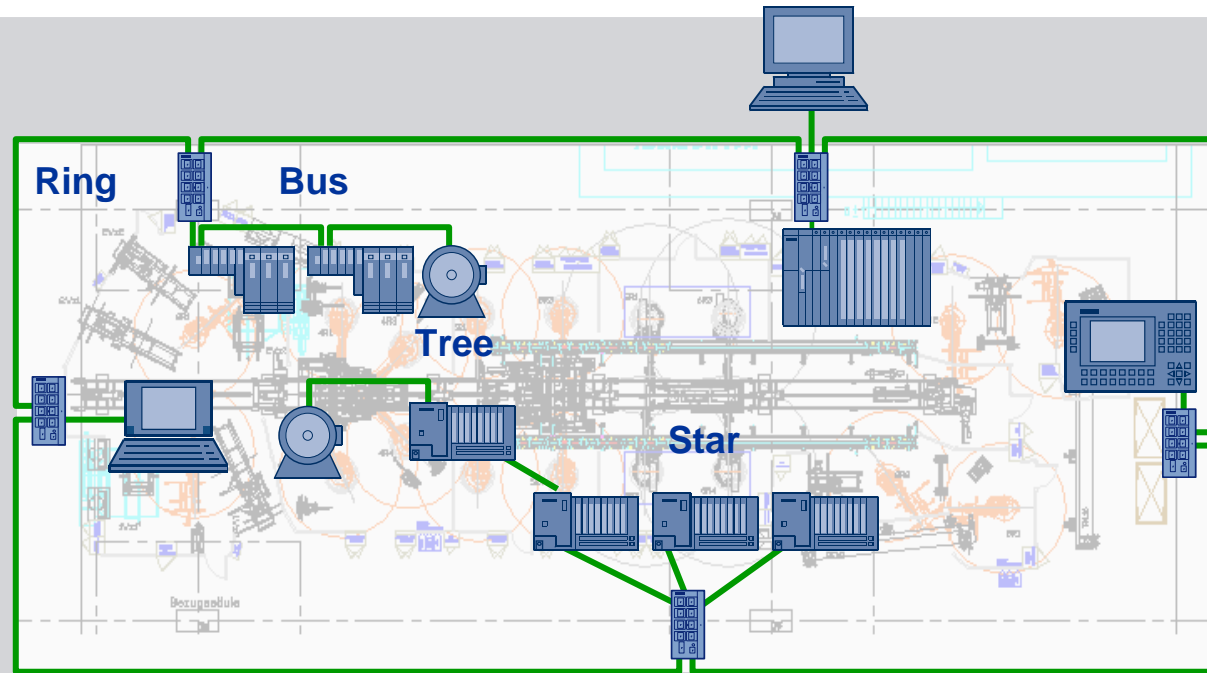
Uniform structures

Performance

Integration

Innovations

Enhancement



## Benefits and added value for our customers

- Bus structure through integration of switch ports in devices
- Tree and star topologies for tree'd configurations
- Redundant rings with reconfiguration in real time

**Cost reduction and more flexibility**

**High availability**

## Agenda

Uniform structures

Performance

Integration

Innovations

Enhancement

## More uniformity in communications

### Building automation



### Mineral water – filling & transport



### Warehouse logistics



### Industrial bakery



### Power management in paper recycling



### Sprinkler control



## Agenda

Uniform structures

Performance

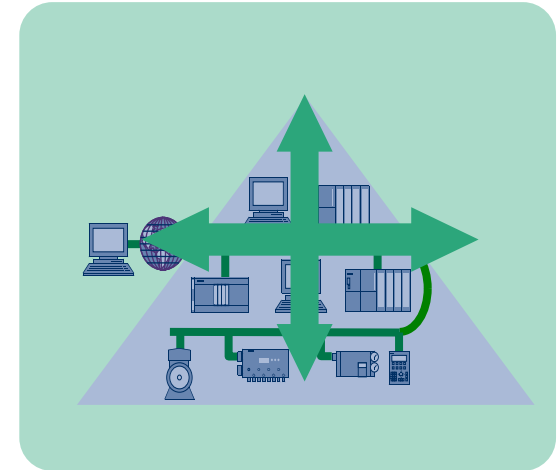
Integration

Innovations

Enhancement

## Benefits and added value for customers

- Connect any automation device to any point
- All automation applications run via just one cable; Real-time and TCP/IP
- Standard and failsafe automation via one cable – or even wireless

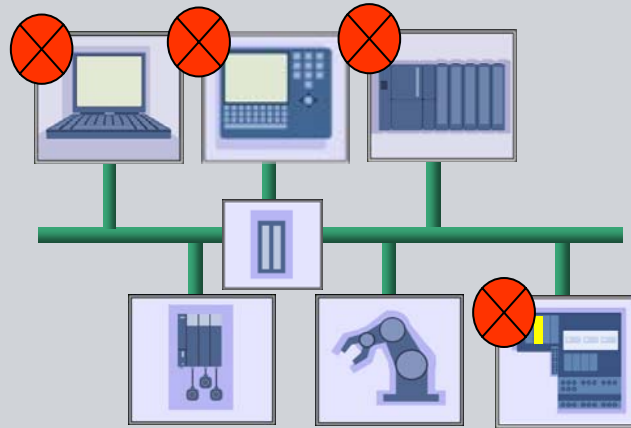


**Summary**

**Flexibility and cost reduction for engineering, installation and maintenance**

**PROFINET  
offers ...**

**... more  
continuity  
(uniform  
structures)**



For diagnosis



## Agenda

Uniform structures

Performance

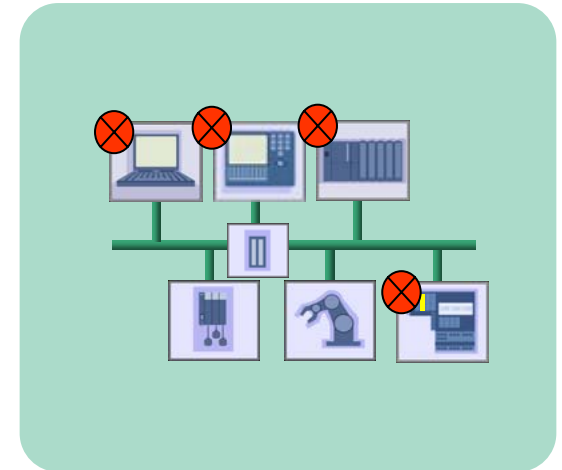
Integration

Innovations

Enhancement

## You want...

- Access to your data from anywhere
- To localize faults quickly
- Fault messages in plain text and foreign languages
- Comprehensive diagnostics down to the channel, even across gateways
- To use common IT standards
- A graphical overview of the real topology
- Preventative diagnostics and maintenance



**Goal: Fast commissioning and increase in plant availability**

## Agenda

### Uniform structures

Performance

Integration

Innovations

Enhancement

## Beside

- Proven channel diagnosis known from field busses
- Guaranteed alarm

... usage of standard Ethernet diagnosis

- Established mechanism like SNMP
- Access anywhere

## on top

- Easy localization with topology views
- Simple access with web

Agenda

Uniform structures

Performance

Integration

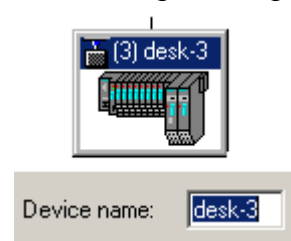
Innovations

Enhancement

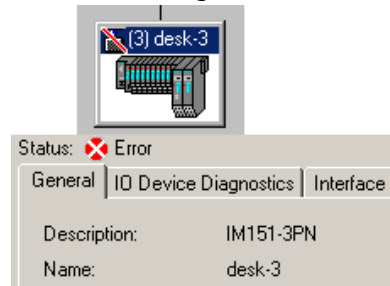
## Comprehensible names of devices

- well defined names for the addressing are also used for diagnostic information, e. g. „desk-3“

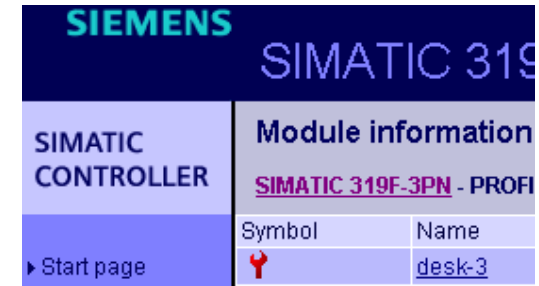
Offline-Engineering



Online-Diagnostics



Web-View



## Consequent support also of the connectors/wiring naming

Offline-Engineering

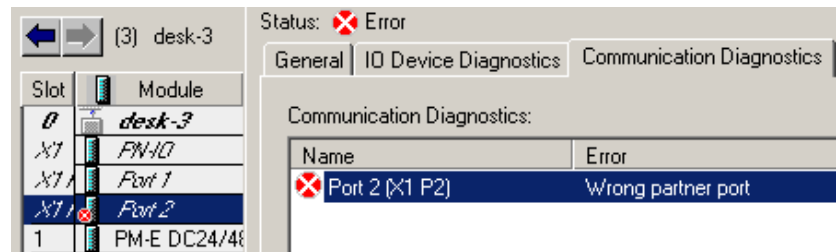
Slot	M..	Order number	I
0	desk	6ES7 151-3BA2	
X1	FN-IO		
X1	Port 1		
X1	Port 2		

Device-Housing



X1 P2

Online-Diagnostics



**Error prevention**  
**Clear identification of the fault location**  
**Fast repair**

## Agenda

Uniform structures

Performance

Integration

Innovations

Enhancement

## Diagnostic overview

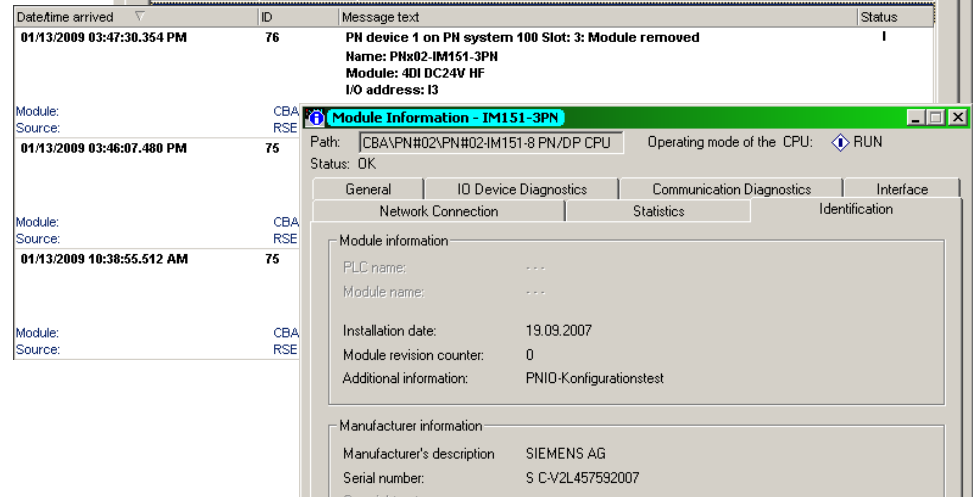
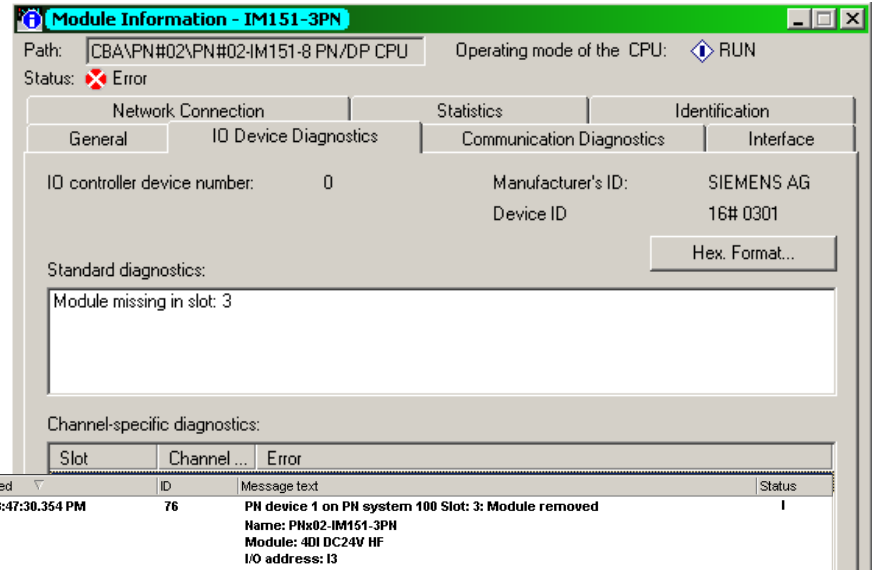
### In levels of detail

- Device
- Modul
- Channel
- Interrupts

## Current fault events

### Acknowledged

## I&M (Identification & Maintenance)



High-speed overview  
 Level of detail according to requirements  
 Standardized display

## Agenda

Uniform structures

Performance

Integration

Innovations

Enhancement

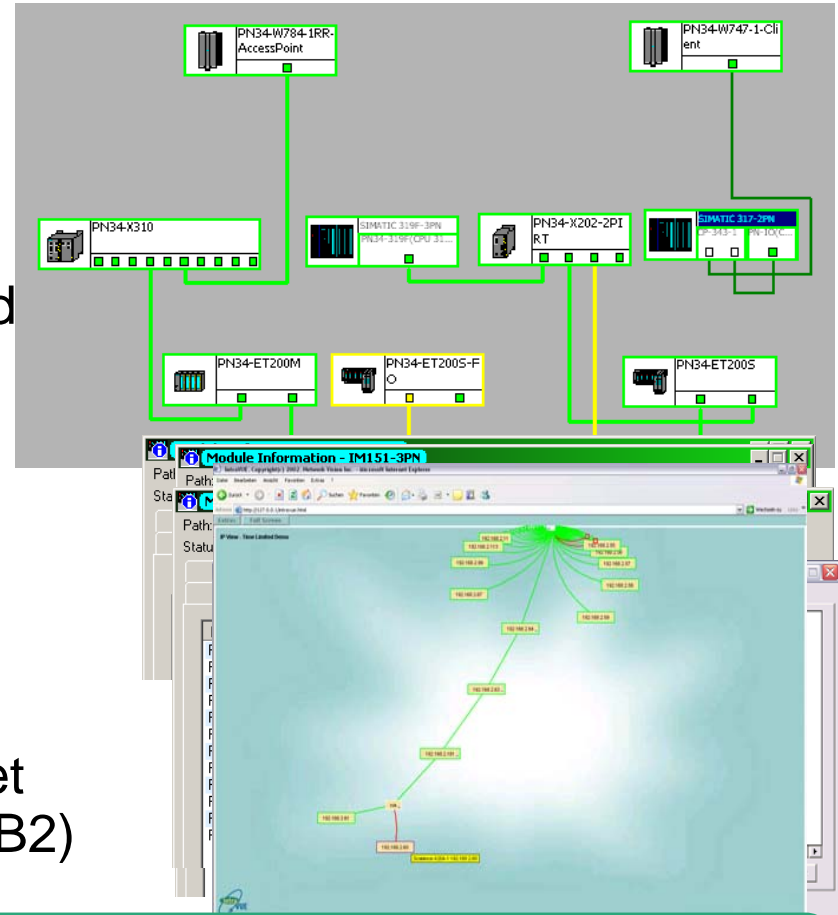
Cable diagnostics as for device diagnostics

- Same modeling of Ports as of I/O channels

Representation in standard and topology view

Additionally with POF: Maintenance (plastic optical fiber)

Additionally: Use of standard Ethernet mechanisms (SNMP/MIB2)



**Familiar engineering**  
**Fast and location-related diagnostics**  
**Use also by standard Ethernet diagnostics**

## Agenda

Uniform structures

Performance

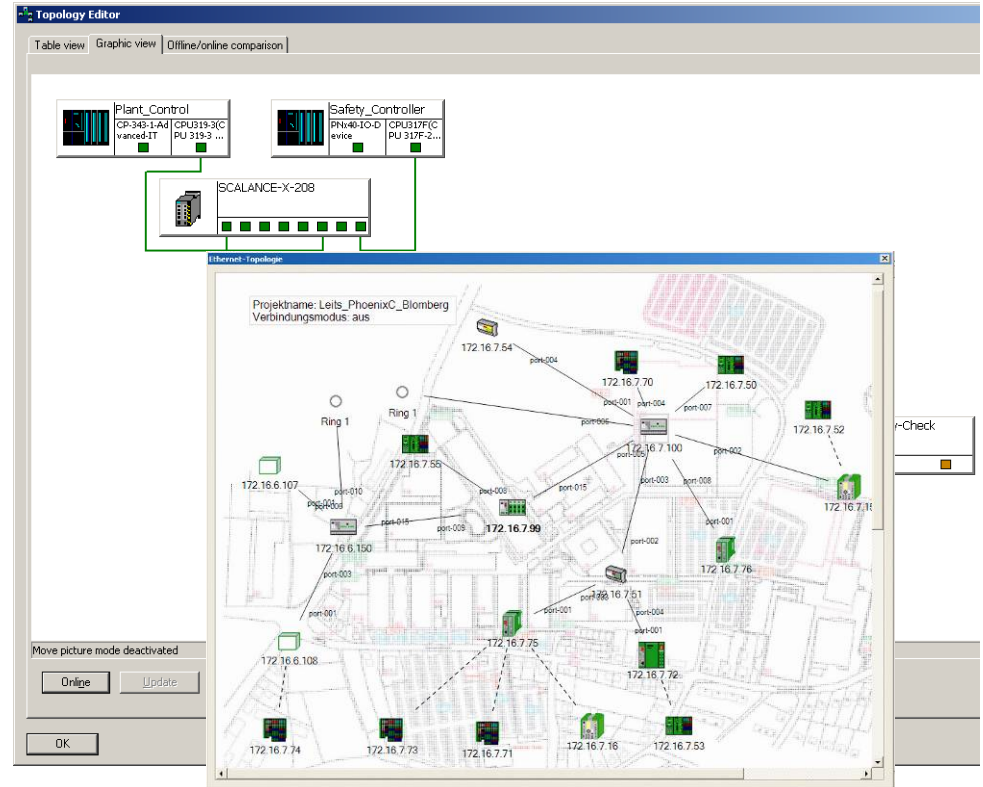
Integration

Innovations

Enhancement

## Engineering view in addition to the actual plant structure

- graphical
- tabular
- offline
- online
  
- integrated in
  - Engineering
  - Controller



**Clear plant overview, documentation**  
**Fast fault location**  
**Fast access to detailed diagnostics**

Agenda

Uniform structures

Performance

Integration

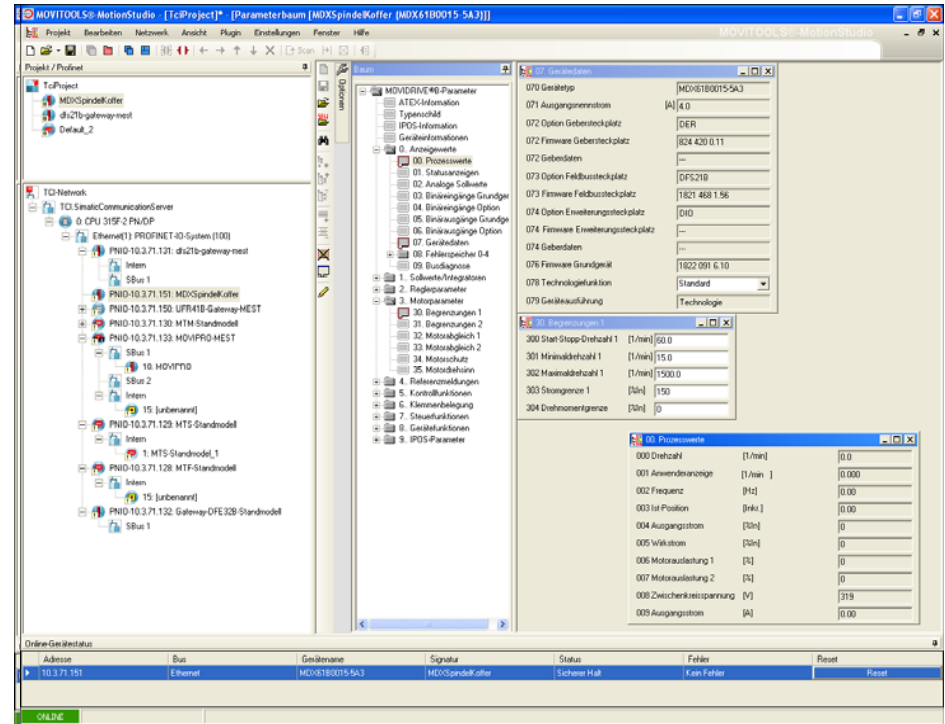
Innovations

Enhancement

Calling of vendor-specific device tools for complex devices

Simple user handling

- Automatic assignment of tool → associated device
- Use of the existing interface paths
- Standardized behavior of tools, e.g. for storage path
- Simple user handling



**Fast, easy access to device tools**  
**Vendor-specific diagnostics and parameter setting**  
**Use of familiar tools**

## Presentation of diagnostics and parameter settings

### Agenda

Uniform structures

Performance

Integration

Innovations

Enhancement

The screenshot displays the Siemens WEB Management interface for a SIMATIC NET Industrial Ethernet Switch (SCALANCE X208). The browser window shows the URL <http://192.168.0.207/>. The interface includes a navigation menu on the left, a main content area with status indicators (Power, Fault, Ports 1-8), and a 'Statistics Packet Size' table.

Port	64	65-127	128-255	256-511	512-1023	1024-1518
1	75	16606584	68	8	4	-
2	-	-	-	-	-	-
3	-	-	-	-	-	-
4	-	5518402	30	6	-	-
5	-	5512938	13	4	-	-
6	-	5518048	12	3	-	-
7	153	4887	175	49	13	-
8	3	309	35	676	-	-
All	231	33161168	333	746	17	-

**Simple access**  
**Regardless of location, even wireless**  
**No engineering**



## Agenda

Uniform structures

Performance

Integration

Innovations

Enhancement

### Control system for data acquisition



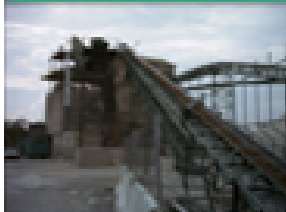
### Encapsulated process



### Gantry robot system



### Gravel extraction



### Water treatment



### Brine extraction



### Coil transport



### Staircase production



### Warehouse logistics



## Agenda

Uniform structures

Performance

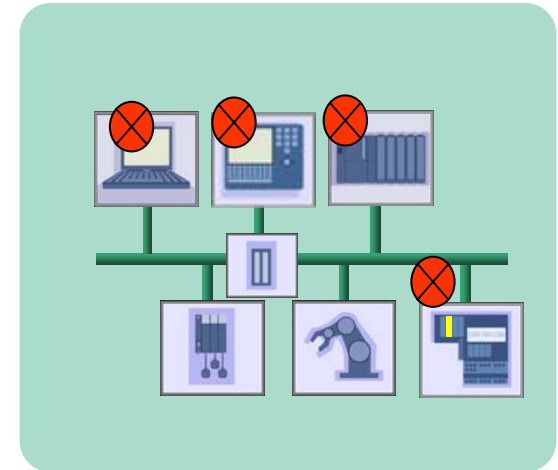
Integration

Innovations

Enhancement

## Added value for our customers

- Fast engineering
- High plant availability
- Cuts costs of configuration and commissioning
- Diagnostic information worldwide
- Fast localization of faults
- Transparency in the network
- Automatic documentation
- Preventative maintenance
- Data available from anywhere

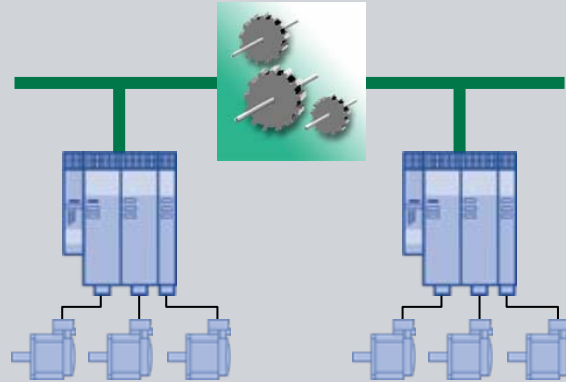


## Summary

... Increase of efficiency by fast commissioning and increased plant availability

**PROFINET  
offers ...**

**...more nodes,  
better  
performance**



By means of  
increased  
performance  
data

Agenda

Uniform structures

Performance

Integration

Innovations

Enhancement

You want ...

- Modular plant/machine concepts
- High availability in production
- Increasing networking
- Raising production speed and quality
- Exploiting advantages of IT in production  
e.g. for diagnostics, remote access  
...



**With PROFINET you increase productivity  
and product quality**

Agenda

Uniform  
structures

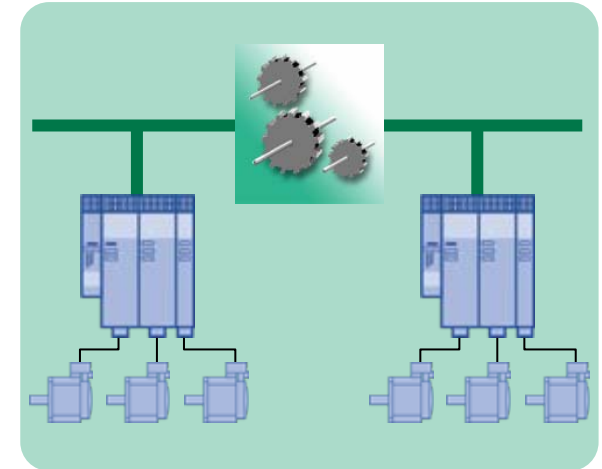
Performance

Integration

Innovations

Enhancement

- ... permits drive synchronization with the highest precision
- ...achieves communication in hard Real-Time for flexible, modular machine concepts
- ...allows large numbers of nodes and the minimum response time
- ...offers scalable Real-time communication with simultaneously unrestricted TCP/IP



Agenda

Uniform structures

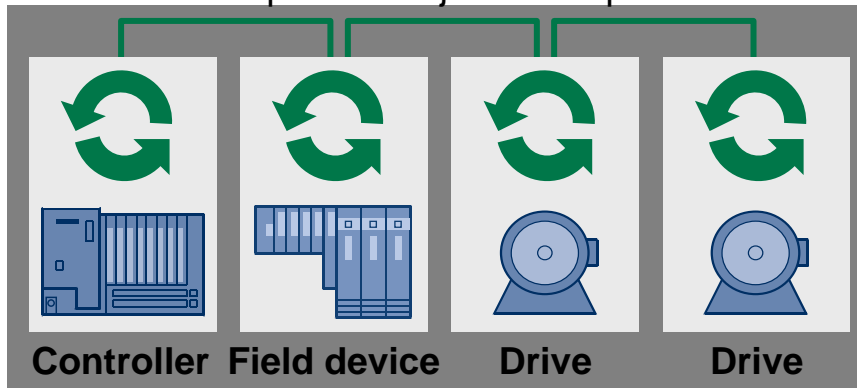
Performance

Integration

Innovations

Enhancement

- Isochronous recording of the actual position values and isochronous activation of the setpoints without jitter
- Example: Printing press, synchronous operation of the print rollers
  - Speed of the paper web: 15 m/s (54 km/h)
  - → Path per  $\mu\text{s}$  = 15  $\mu\text{m}$
  - 1000 grid points / cm (2540 dpi)
  - → One grid point = 10  $\mu\text{m}$
  - → Requirement: jitter  $\ll$  1  $\mu\text{s}$



**Less jitter → Better quality**

Agenda

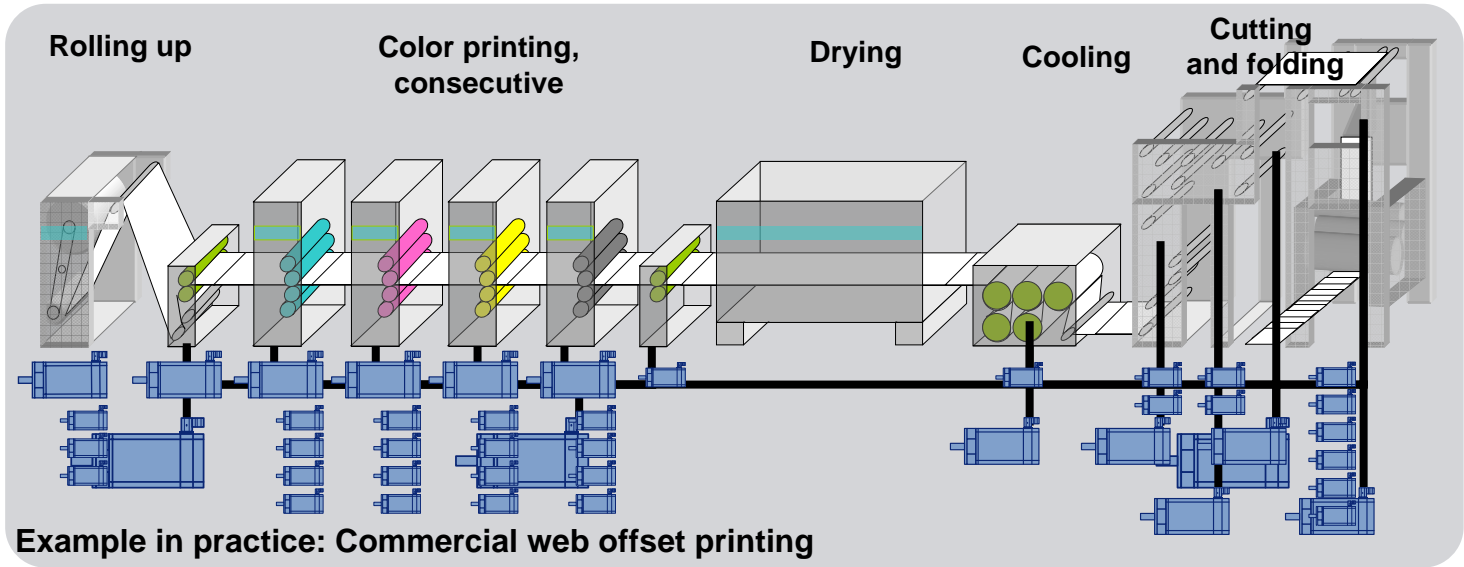
Uniform structures

Performance

Integration

Innovations

Enhancement



- Shorter cycle times by dividing into several sub-applications
- Increased precision in the machine
- Product change "at the touch of a button" by use of individual drives
- Simple expandability of the machine
- Increasing the availability by means of modular structure

**Short cycle times**  
→ higher productivity

**Individual drives**  
→ greater flexibility

Agenda

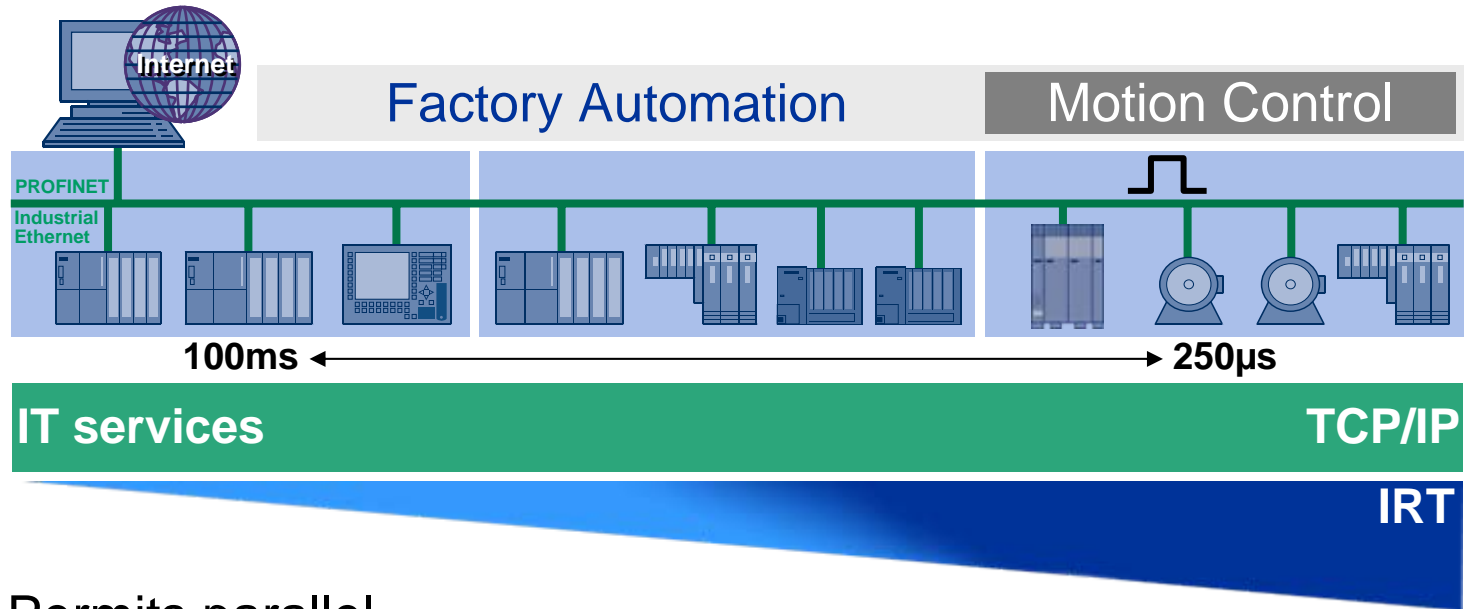
Uniform structures

Performance

Integration

Innovations

Enhancement



Permits parallel...

- ... direct online access to field devices
- ... location-independent maintenance and service (including remote)
- ... savings in the recording of production/quality data

**Scalable Real-time with simultaneous, unrestricted IT communication**



Agenda

Uniform structures

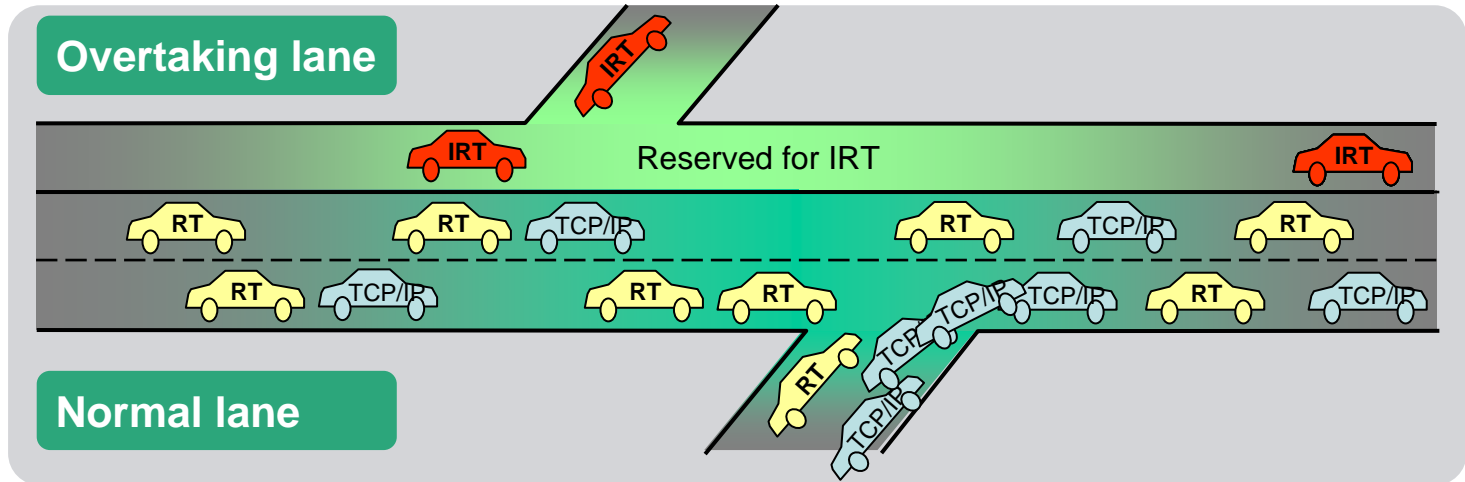
Performance

Integration

Innovations

Enhancement

- Fast Ethernet with switching technology → Fast simultaneous exchange of setpoint and actual values (100 Mbit/s)
- Time synchronization of the switches → Requirement for Isochronous mode
- Deterministic communication cycle → Essential for motion control
- Reservation of time areas → Guaranteed performance for motion & IT



# PROFINET with IRT (Isochronous Real-time)

Agenda

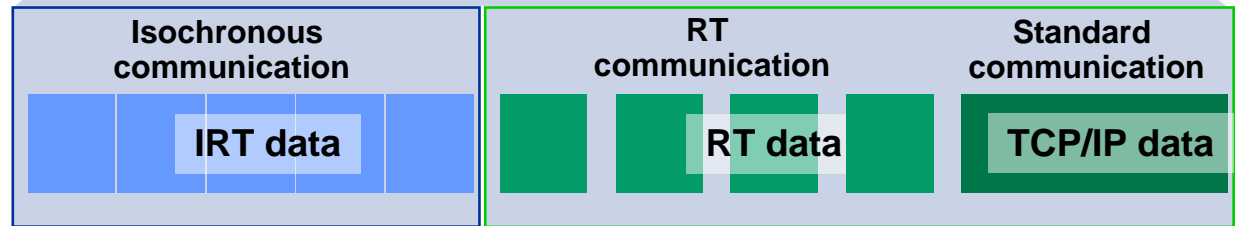
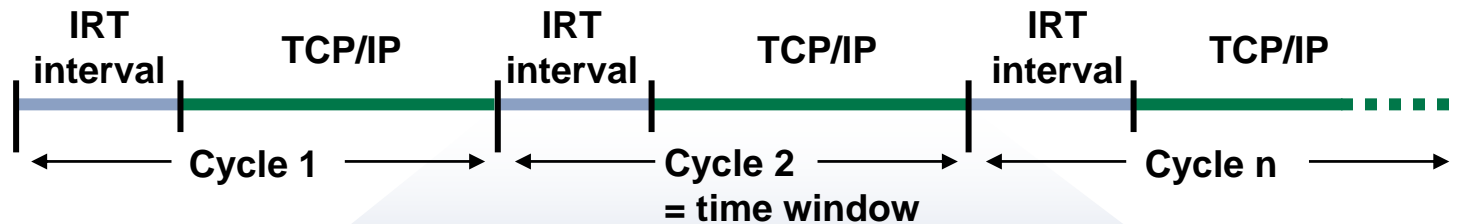
Uniform structures

Performance

Integration

Innovations

Enhancement



- Bandwidth reservation for isochronous communication
- IRT permits high-precision synchronization

**Hardest Real-time by means of Isochronous Real-time (IRT)**

Agenda

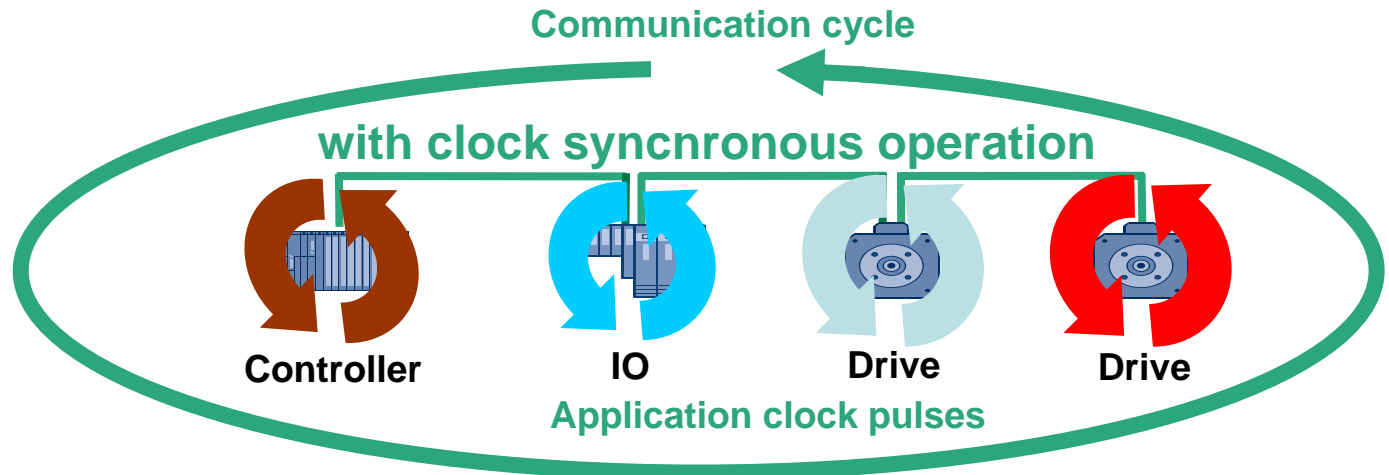
Uniform  
structures

Performance

Integration

Innovations

Enhancement



- Synchronization of the application clock pulses to the communication cycle of PROFINET with IRT
- Mechanical gears, shafts and cams are increasingly substituted by regulated servo drives
- Synchronization of the axes with maximum precision
- Deterministic terminal-terminal reactions

**Ideal for motion control with electronic shafts, gears and cams in multi-axes applications**

Agenda

Uniform structures

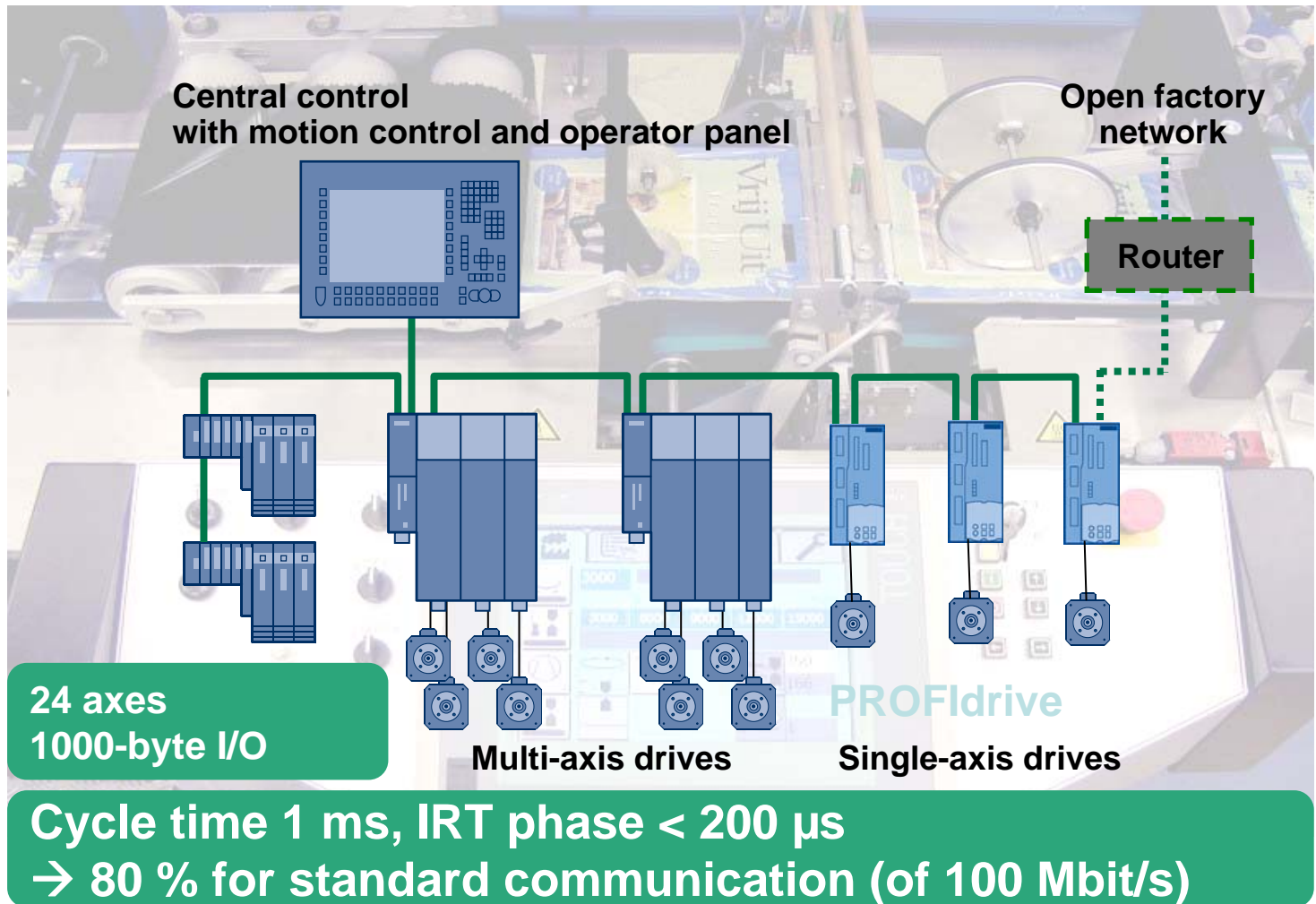
Performance

Integration

Innovations

Enhancement

## ■ Typical for a PC-based automation platform



Agenda

Uniform structures

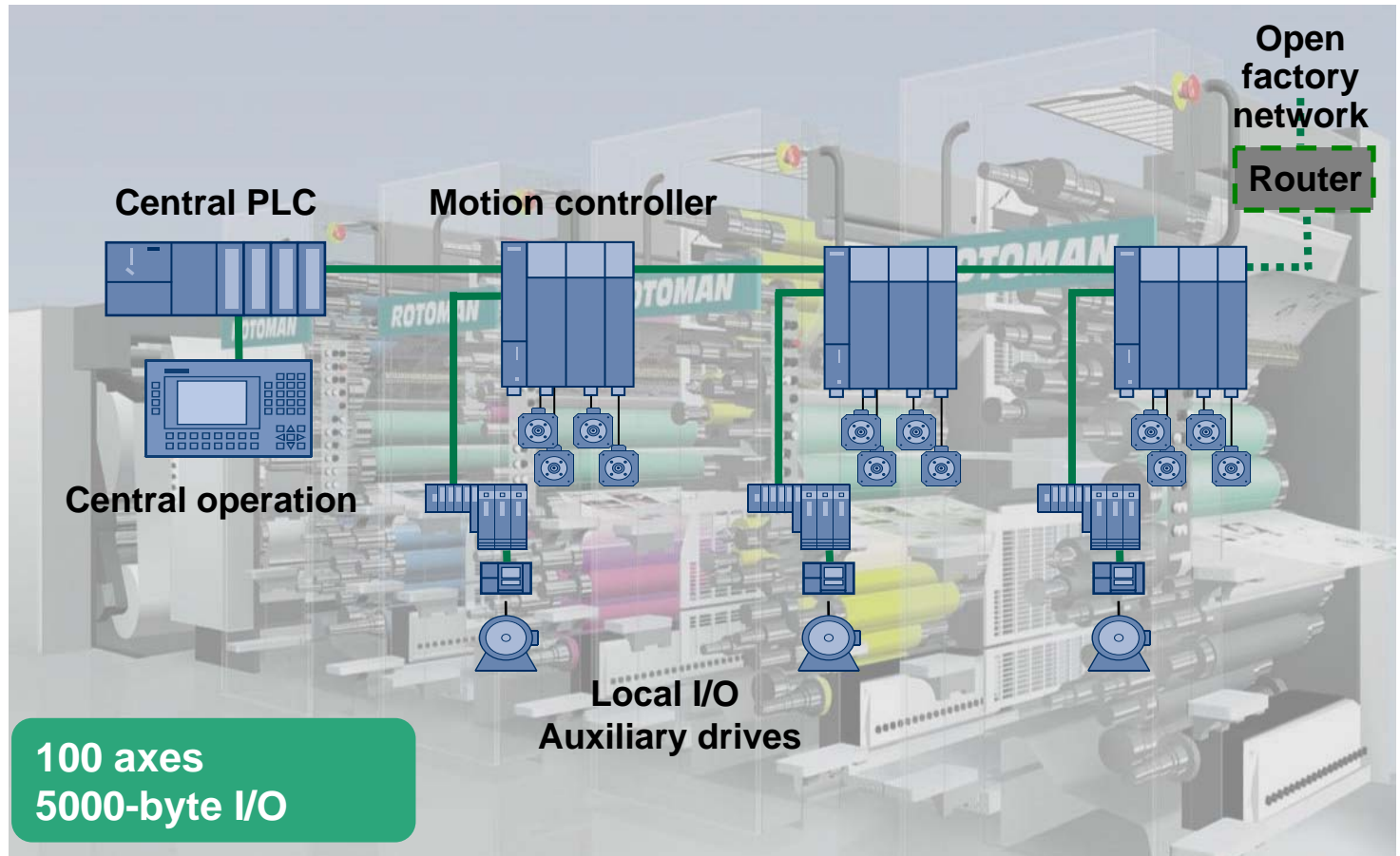
Performance

Integration

Innovations

Enhancement

## ■ Example: Continuous web



**100 axes  
5000-byte I/O**

**Cycle time 1 ms, IRT phase < 200 μs  
→ 80 % for standard communication (of 100 Mbit/s)**

Agenda

Uniform structures

Performance

Integration

Innovations

Enhancement

- Benefits and added value for our customers
- Hard Real-time and parallel TCP/IP communication
- Isochronous applications for Motion Control
- Quantum leap in comparison with conventional fieldbuses

### Performance values for Motion Control applications with PROFINET and IRT

Cycle time	1 ms	500 ms	250 ms
Number of nodes <sup>*)</sup>	272	128	56
Jitter	<1 µs	<1 µs	<1 µs
Reserved for open communication with standard IT protocols	50%	50%	50%

\*) Number of devices each with 40 bytes input data and 40 bytes output data on a controller with 4 ports  
The limits of a specified controller regarding I/O area, cycle time and number of nodes must be considered

**PROFINET – for higher productivity and product quality**

Agenda

Uniform  
structures

Performance

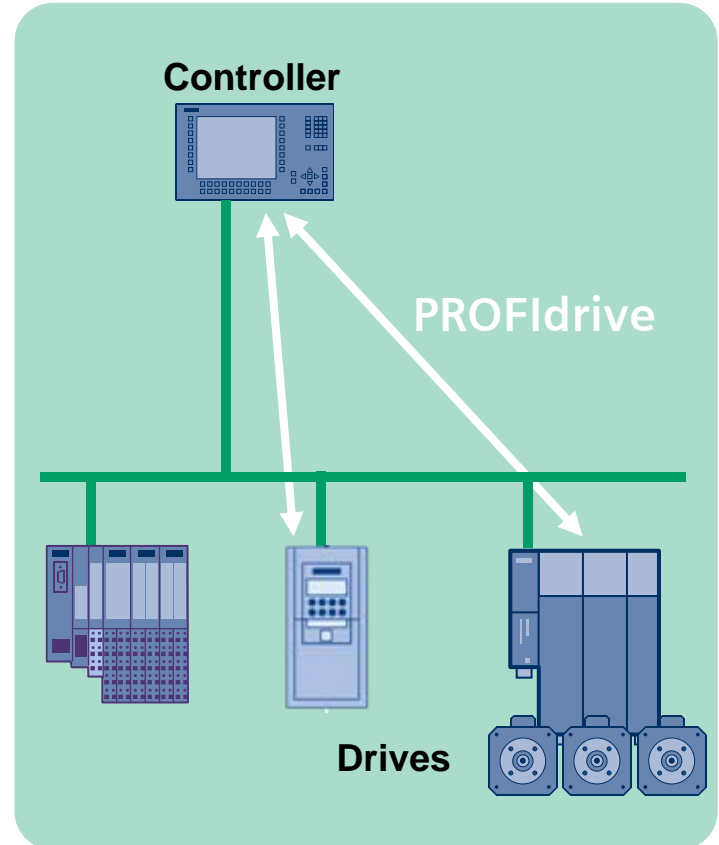
Integration

Innovations

Enhancement

## PROFdrive

- Is the application profile for drives on PROFIBUS and PROFINET
- Is cross-vendor and ensures interoperability between drives and controllers
- Offers the same application view as with PROFIBUS and PROFINET
- Is standardized through PROFIBUS & PROFINET International (PI)



**Worldwide standard communications for drives**



Agenda

Uniform structures

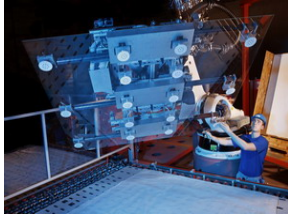
Performance

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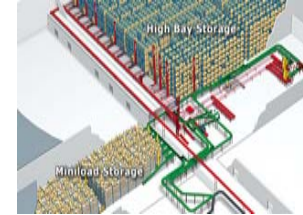
## Float glass line



## Chocolate production machine



## Warehouse handling system



## screen printing machine



## Press feeder



## Press line



## Web offset printing machine





Agenda

Uniform  
structures

Performance

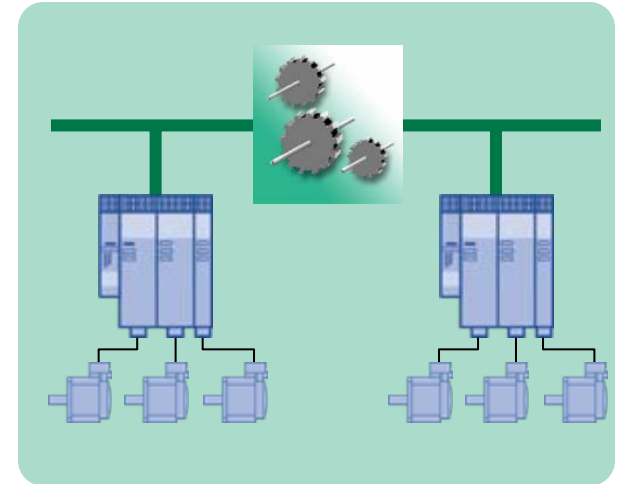
Integration

Innovations

Enhancement

... due to PROFINET...

- Higher productivity due to shorter cycle times
- Greater flexibility due to modular machine architecture and individual drives
- Greater quantity structures
- Real-time and TCP/IP, without compromise
- Quantum leap for motion control
- Scalable without system discontinuity

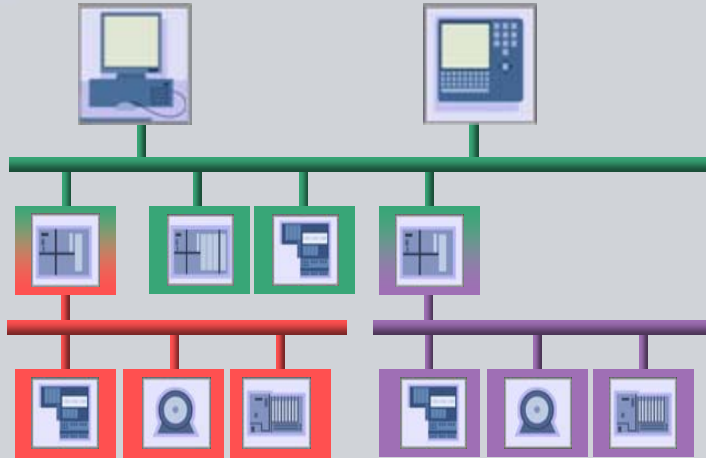


**Summary**

**for increased productivity and product quality**

**PROFINET  
offers ...**

**... seamless  
integration of  
existing  
systems**



Such as  
components,  
fieldbuses and  
networks

Agenda

Uniform structures

Performance

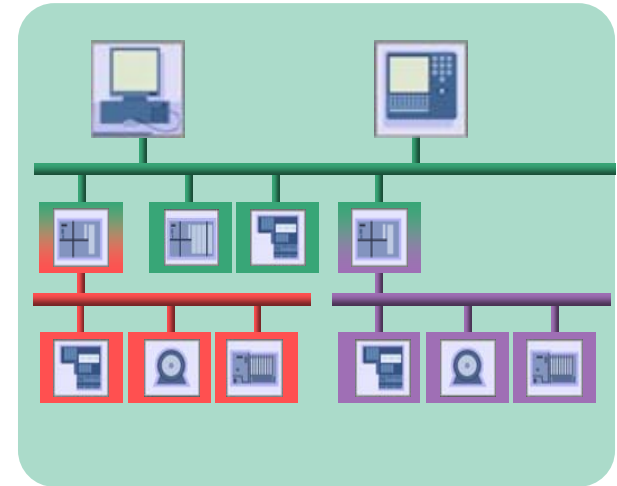
Integration

Innovations

Enhancement

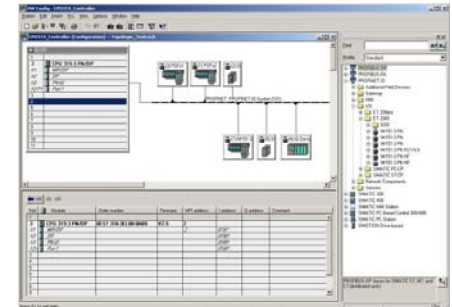
Do you want to...

- Easily integrate existing fieldbus systems?
- Integrate existing Ethernet networks?
- Continue using existing user programs?
- Continue using existing devices?



And ...

- Continue using your existing knowledge and tools without a problem?



**Minimizes the time and expense of setting up your system with or migrating to PROFINET**

Agenda

Uniform structures

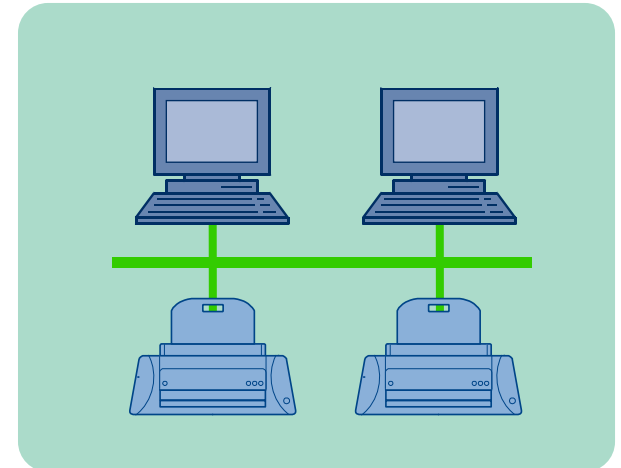
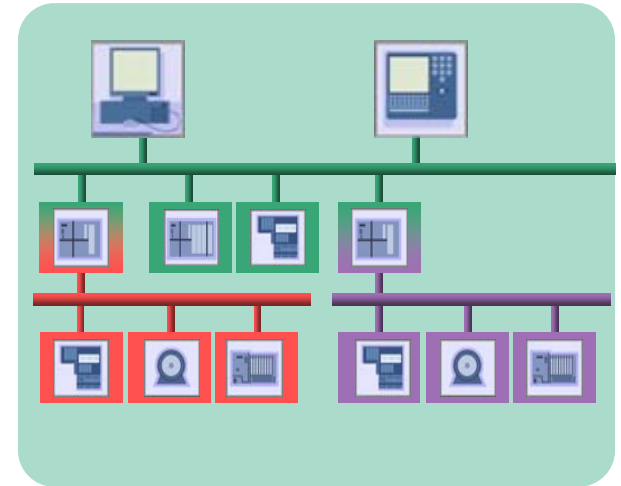
Performance

Integration

Innovations

Enhancement

- Integration of existing fieldbus systems through proxy technology
- PROFINET is standard Ethernet
- Lets you continue using your user programs
- Makes it easy to convert existing devices
- Engineering – with the same look & feel



Agenda

Uniform structures

Performance

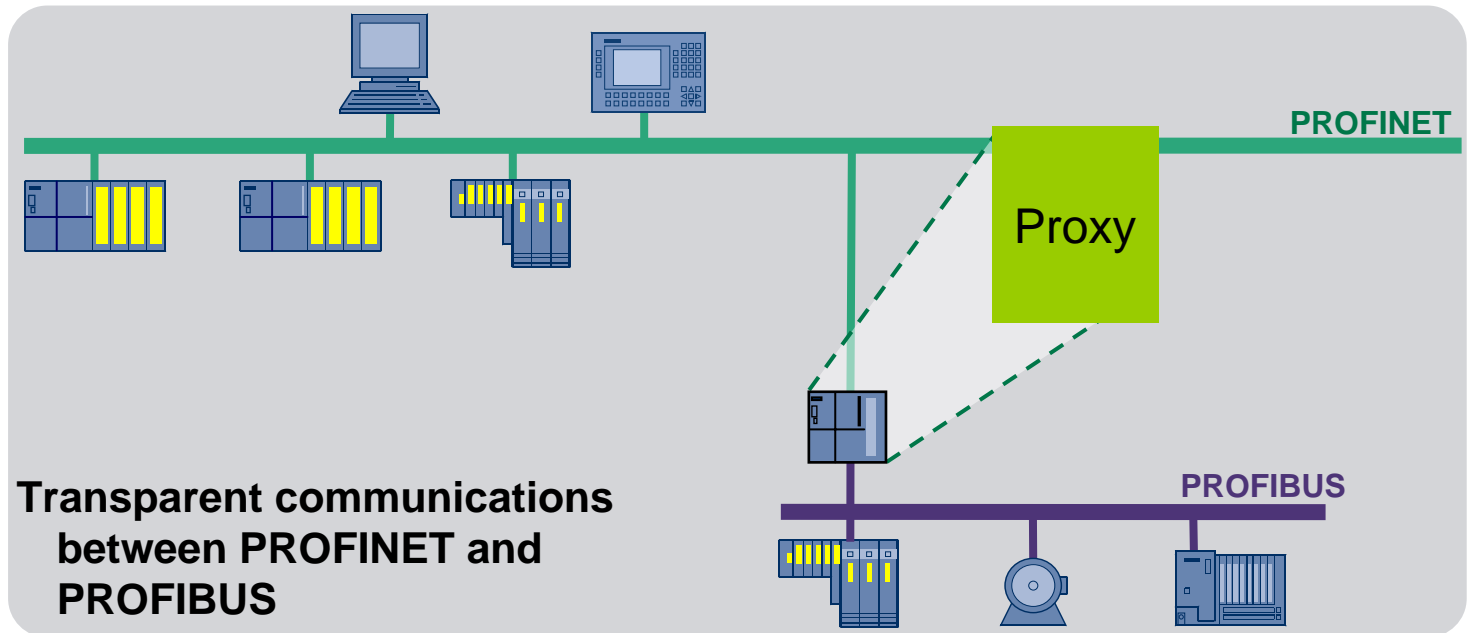
Integration

Innovations

Enhancement

## Benefits and added value for our customers

- Including gateways for PROFIBUS, Interbus, AS-Interface and other fieldbuses
- Including controllers with PROFINET and PROFIBUS interface



**Transparent communications between PROFIBUS and PROFINET**

**Protects your investment**

**Transparent integration without programming**

Agenda

Uniform structures

Performance

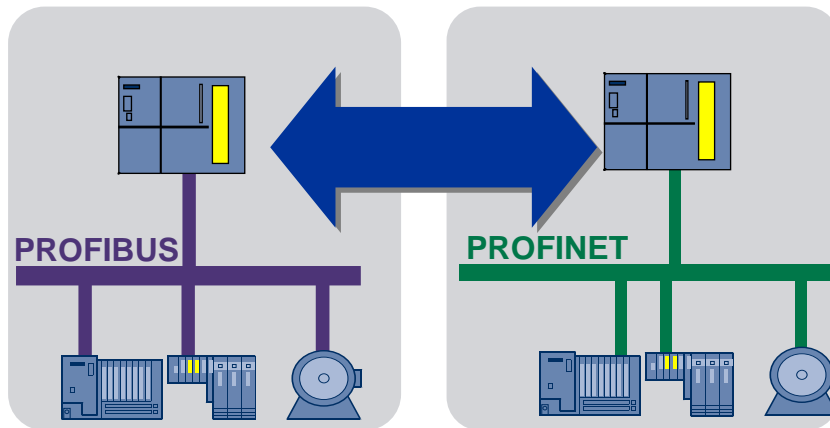
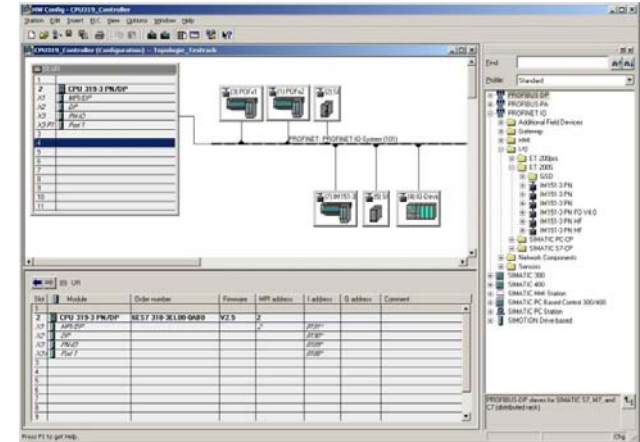
Integration

Innovations

Enhancement

## Benefits and added value

- Just reconfigure your hardware...
- ... no reprogramming work necessary
- use the same exact tools with the same look & feel
- same system design for PROFIBUS and PROFINET



**Reduce the time and expense of engineering and testing**

Agenda

Uniform structures

Performance

Integration

Innovations

Enhancement

## Plaster production



## Water treatment



## Power management



## Building automation



## Brick production



## Data compilation / Data control



## Alarm management



## Bio-Ethanol production



Agenda

Uniform structures

Performance

Integration

Innovations

Enhancement

## Protects your investment

- Seamless integration of existing fieldbuses
- Easy conversion of existing devices
- No additional tools or training needed

## Saves costs

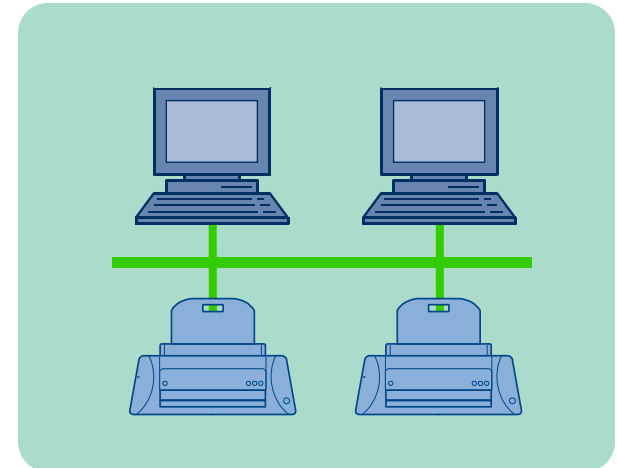
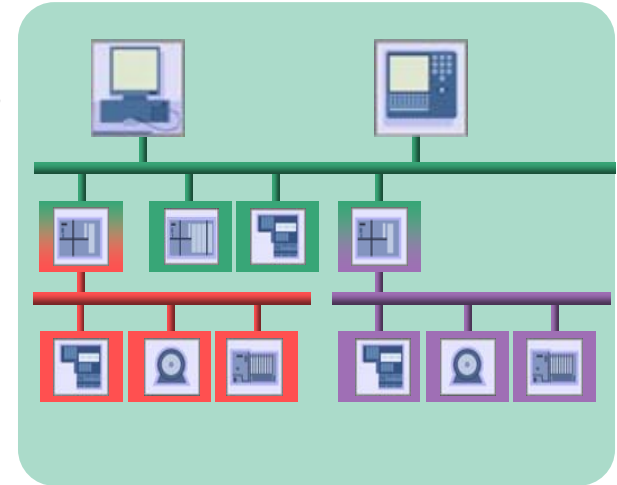
- Uses existing Ethernet networks

## Uniformity

- Uniform physical network concept

## Saves time

- Reduces engineering and testing time
- Cuts time needed for migration



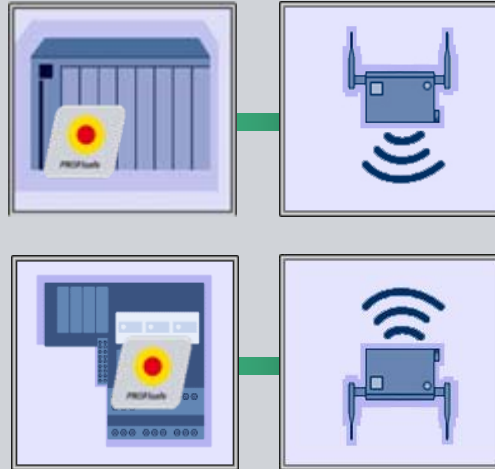
**Summary**

**Minimizes the time and expense of setting up your system with or migrating to PROFINET.**



**PROFINET  
offers ...**

**... new,  
innovative  
applications**



With wireless  
automation

Agenda

Uniform  
structures

Performance

Integration

Innovations

Enhancement

## Your constraints...

- Expensive slip rings or slip conductors
- Low flexibility & limited space
- High maintenance costs

## Your needs...

- An easy networking solution even for hard-to-reach places
- More space & greater flexibility
- Less maintenance costs



Agenda

Uniform structures

Performance

Integration

Innovations

Enhancement

You also want to ...

- Increase availability and boost productivity
- Integrate mobile clients
- Guarantee easy expandability

But need to have ...

- Standardized wireless technology
- No restrictions compared to normal cabling (safety, security)



**The answer is: Industrial Wireless LAN with PROFINET**

Agenda

Uniform  
structures

Performance

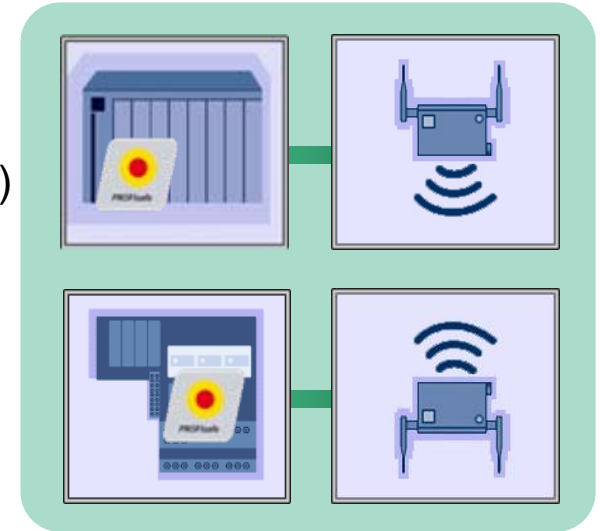
Integration

Innovations

Enhancement

## PROFINET via WLAN with ...

- Standardized technology
  - Easy engineering  
(planning, set-up, operation, documentation)
  - Network security
  - Failsafe communications  
("Safety Integrated")
  - Mobile HMI
- 
- ...as reliable, rugged, safe and secure as  
hard-wired systems!



Agenda

Uniform structures

Performance

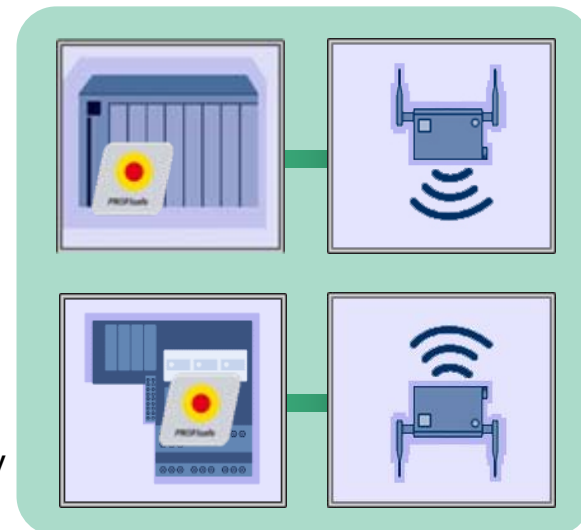
Integration

Innovations

Enhancement

## PROFINET based on standard Ethernet

- Wireless communications in compliance with IEEE standard possible
- Industrial WLAN (IEEE 802.11)
  - cyclic and acyclic data transmission
  - Supervision of wireless connection
  - Redundant wireless operation over 2 separate wave bands for raised availability
  - PROFIsafe over WLAN
- Bluetooth (IEEE 802.15.2)
  - Coexistence with WLAN
- Fast commissioning
- Easy diagnostics



**Using established standards for innovative applications**

Agenda

Uniform  
structures

Performance

Integration

Innovations

Enhancement

## Plaster production



## Machine tools



## Coil transport



## Transshipment



## Staircase production



## Warehouse logistics



## Brick production



## Warehousing



## Cement industry





Agenda

Uniform  
structures

Performance

Integration

Innovations

Enhancement

## Cement transport



## High-bay warehouse



## Transport & logistics



## Body shop



## Mobile fastening controller



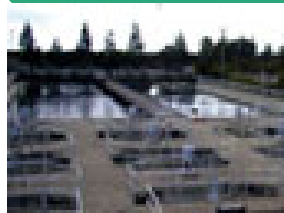
## Overhead monorail conveyor



## Gantry robot system



## Water treatment



## Air freight



Agenda

Uniform  
structures

Performance

Integration

Innovations

Enhancement

...Higher productivity based on

- Increased plant availability compared to mechanical solutions (e.g. trailing cables)

...Lower costs thanks to

- Less maintenance & installation work
- Use of standard components even for failsafe communications

...Greater flexibility and mobility

- Communications from any location
- Easy expandability and modification
- Independence from mechanical bounds



**Summary**

**...greater flexibility and mobility**



**PROFINET  
offers ...**

**... new,  
innovative  
applications**



With integrated  
safety

Agenda

Uniform structures

Performance

Integration

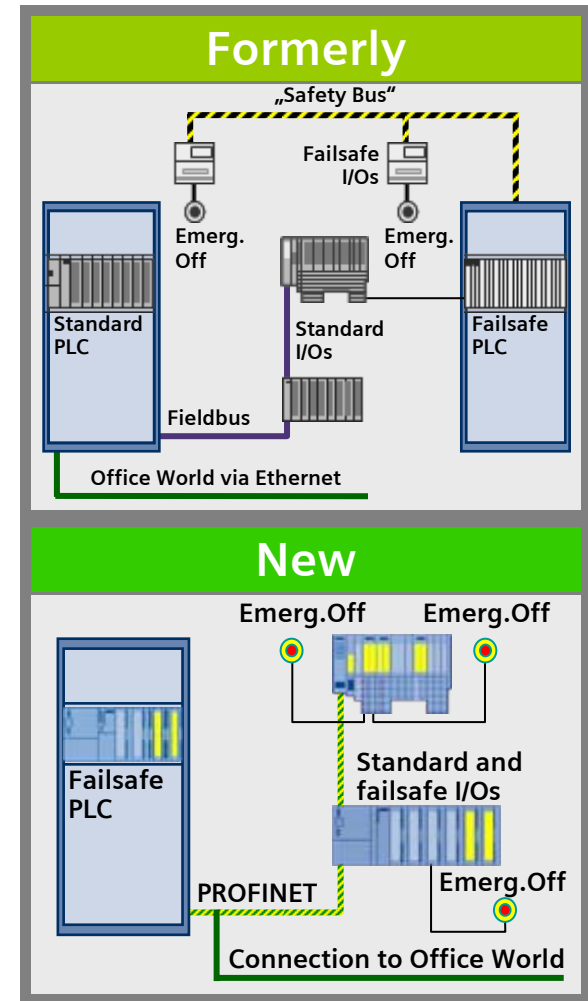
Innovations

Enhancement

## One bus for standard and failsafe automation

- Meets the highest safety categories
- Safety Integrity Level 3 / PL e / Cat. 4
- Uniform diagnostics and uniform user interface
- Reduce the number of types, parts and interfaces

**Save time, space and money with Safety Integrated!**



Agenda

Uniform structures

Performance

Integration

Innovations

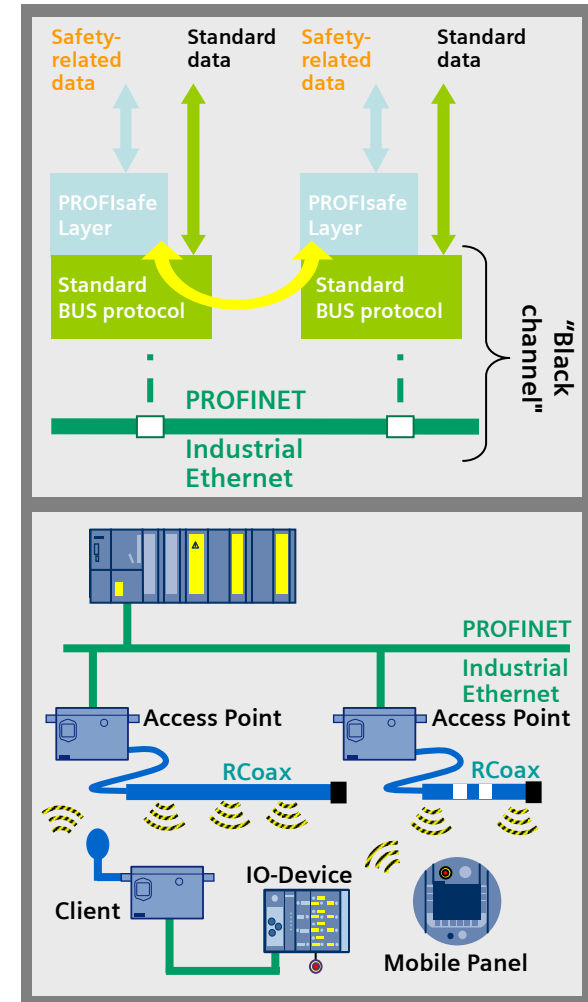
Enhancement

## Use of the PROFIsafe profile

- Tested and accepted with PROFINET
- Standard and failsafe communications over the same transmission path
- Can be used for stationary and mobile  
Emergency Stop function
- Allows the use of extended safety functions by use of dedicated PROFIsafe devices

Even wireless...

**Failsafe and available, just like hard-wired!**



Agenda



Uniform structures

Performance

Integration

Innovations

Enhancement

- Using PROFIsafe and PROFINET can satisfy all requirements when it comes to ensuring complete safety for humans, equipment, and the environment.
- First communications standard developed in accordance with safety standard IEC 61508
- Developed to IEC 61784-3-3, PROFIsafe is the international standard
- PROFIsafe handles potential faults (e.g. invalid addresses, delays, data loss) by means of
  - Serial numbering
  - Time monitoring
  - Authenticity monitoring
  - Additional CRC backup
- Evaluated by  BGIA and 
- Drive technology also fits in seamlessly here with the integrated safety functions according to IEC 61800-5-2.



Agenda

Uniform  
structures

Performance

Integration

Innovations

Enhancement

## ■ The basic safety functions ...

- „Safe Torque Off ”
- „Safe Stop 1”
- „Safe Brake Control“
- ... always leads to a **safe disconnection** of the energy feed to the motor when selected, e.g., in a hazard situation.



## ■ The advanced safety functions ...

- „Safe Operating Stop“
- „Safe Stop 2“
- „Safety-Limited Speed“
- „Safe Speed Monitor“
- ... allow **reliable monitoring** of the drive during operation or when a temporary exceptional situation, such as setup or maintenance work, occurs. .

- It is possible to carry out maintenance work conveniently and safely, which significantly reduces machine and equipment downtimes.

Agenda

Uniform structures

Performance

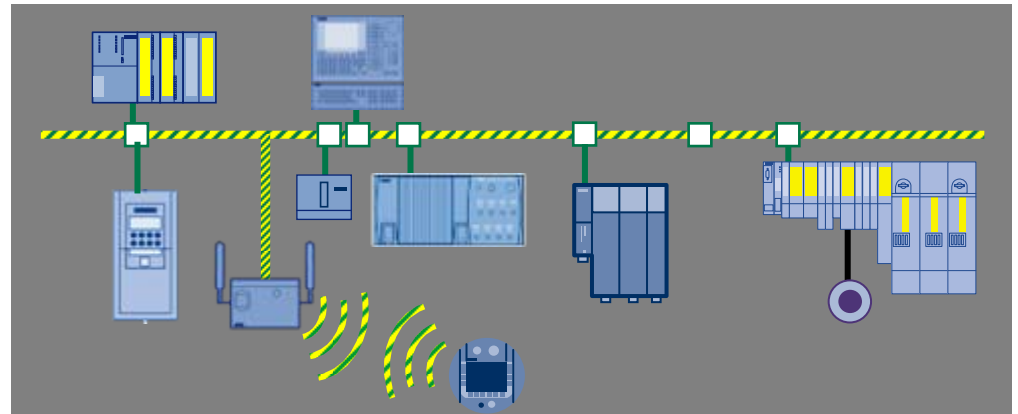
Integration

Innovations

Enhancement

## Safety for humans and machines

- Safety and standard data over one connection, within one station
- PROFIsafe via PROFIBUS and PROFINET



**Summary**

**Save space, time and money with PROFIsafe**

**PROFINET  
offers ...  
... new,  
innovative  
applications**



With distributed,  
intelligent  
structures

Agenda

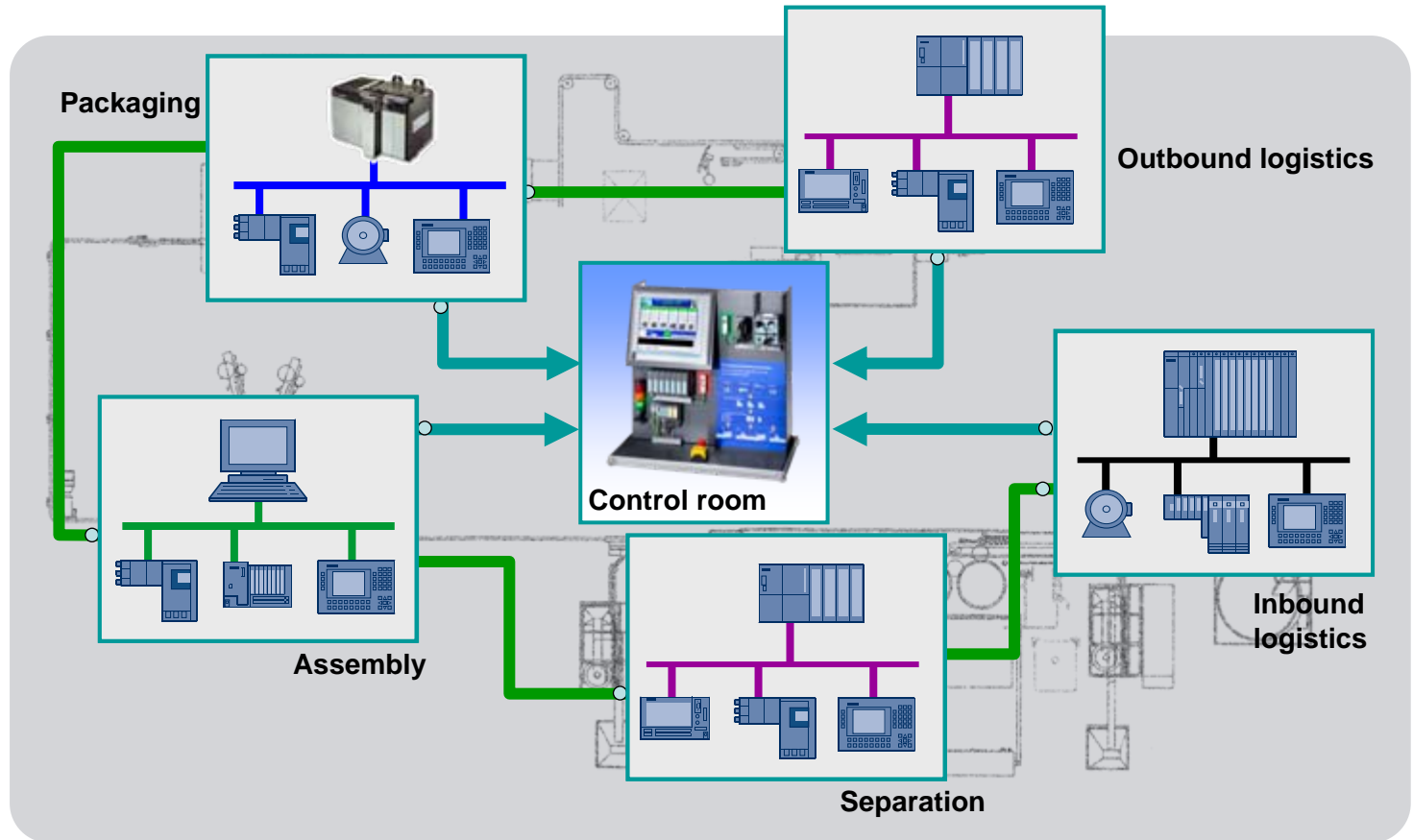
Uniform  
structures

Performance

Integration

Innovations

Enhancement



- Machines from different OEMs
- OEMs implement different automation architectures
- Machines controlled by different PLCs



Agenda

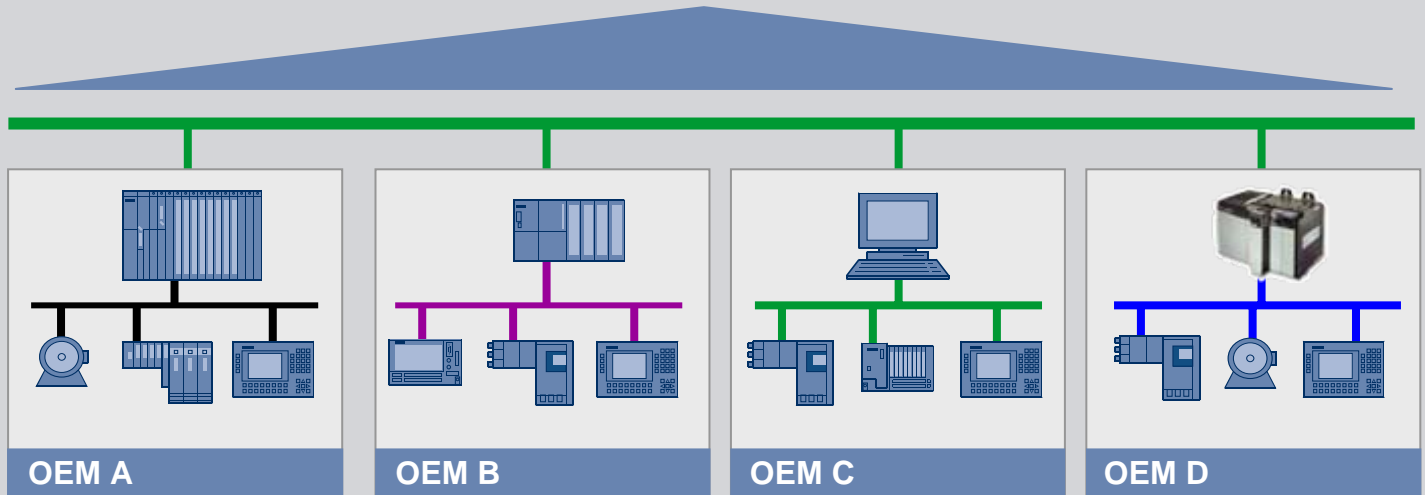
Uniform structures

Performance

Integration

Innovations

Enhancement



**The increasing complexity of machines and faster production rates present new engineering challenges.**

Agenda

Uniform structures

Performance

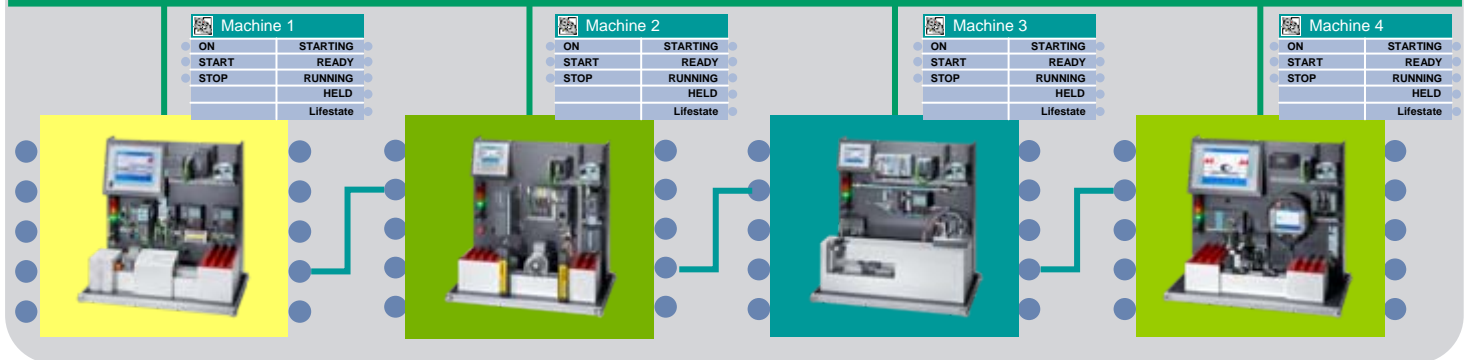
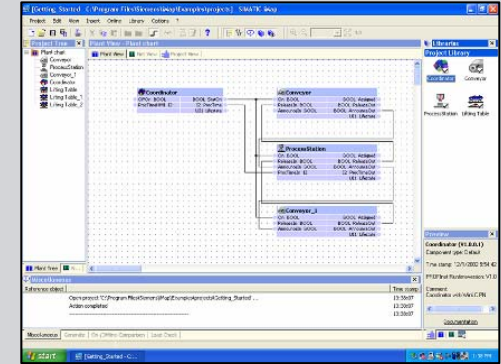
Integration

Innovations

Enhancement

for...

- Plant-wide engineering of machine-machine communications
- System-wide communications based on Industrial Ethernet



## PROFINET CBA – Component Based Automation

## Agenda

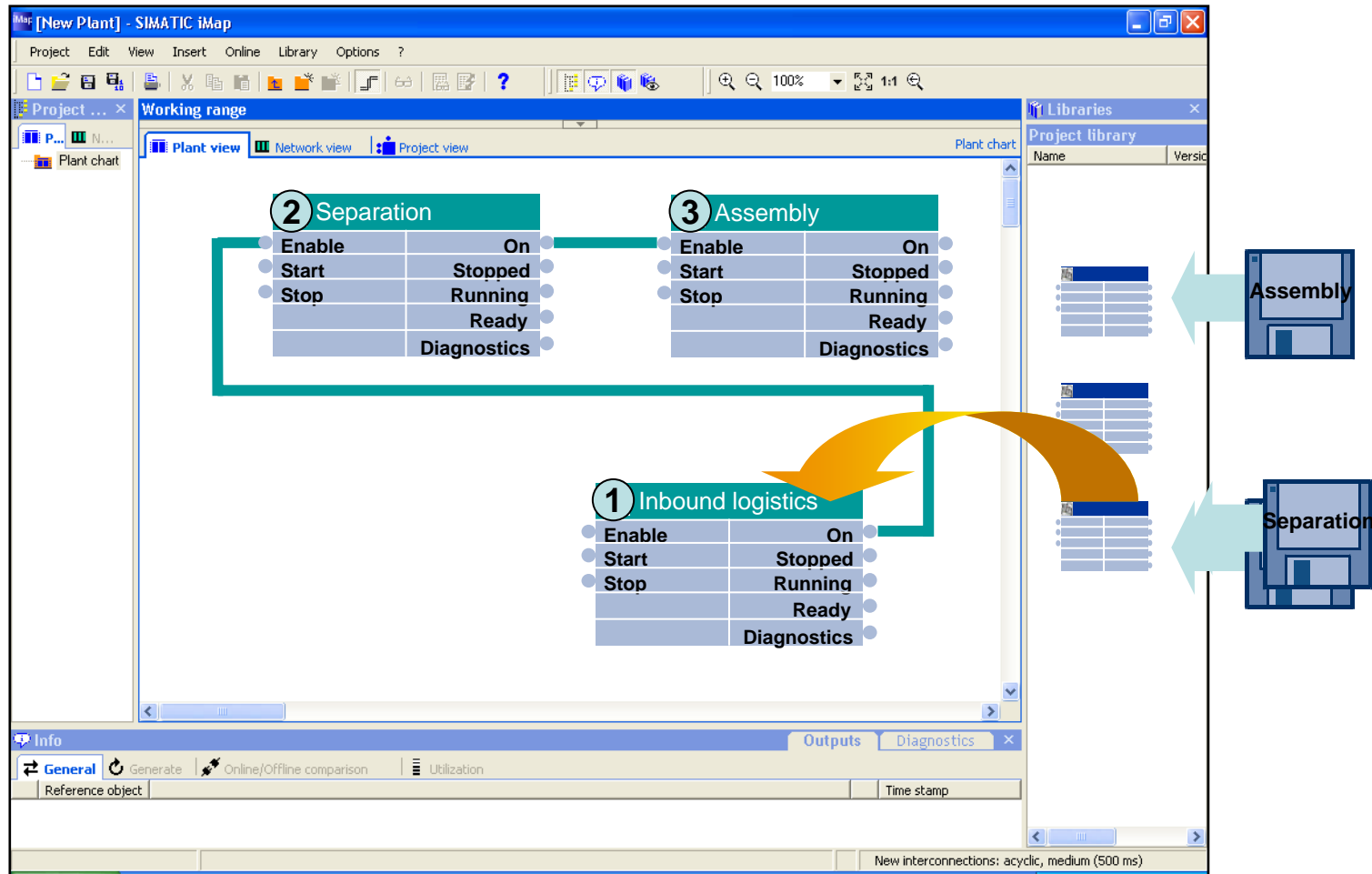
Uniform structures

Performance

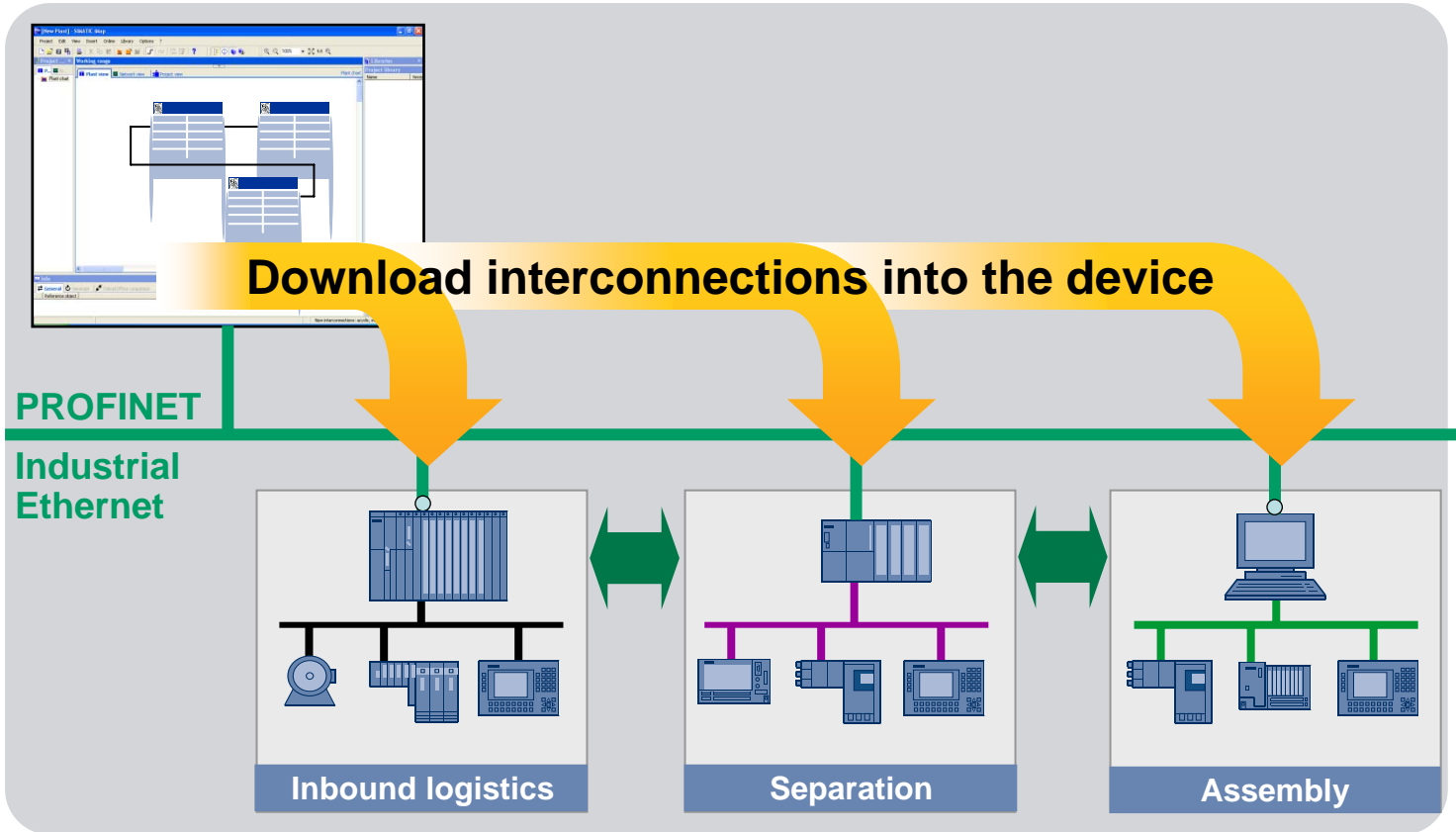
Integration

Innovations

Enhancement



- Agenda
- Uniform structures
- Performance
- Integration
- Innovations
- Enhancement



**Automatic set-up of device communications**

Agenda

Uniform  
structures

Performance

Integration

Innovations

Enhancement

## Packaging



## Window production



## Lamp production



## Razor blades



## Production line



## Production & logistics



## Paint shop



## Tobacco mixing



## Water treatment



Agenda

Uniform  
structures

Performance

Integration

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Enhancement

## Water treatment



## Chocolate manufacturing



## Packaging of cosmetics



## Shampoo manufacturing



## Gas concentration monitoring



## Coin manufacturing



## Transport and conveying system



## Chocolate manufacturing



## Steel production



Agenda

Uniform structures

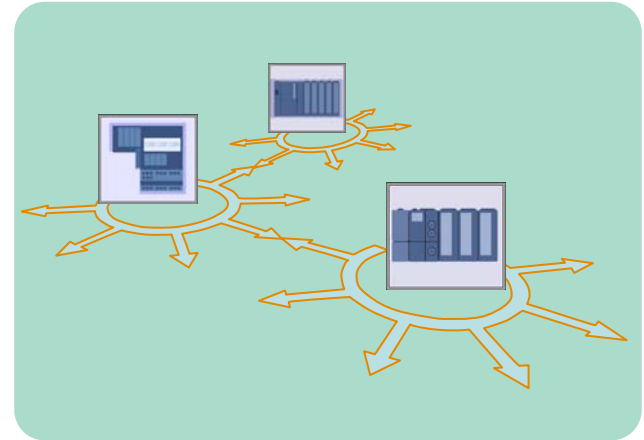
Performance

Integration

Innovations

Enhancement

- Configuration of communications instead of programming and troubleshooting
- Flexibility in configuring and reconfiguring production flow
- Modification or exchange of machines without any adverse affects on communications or integration of the other systems
- Integrated plant-wide system diagnostics
- Standardized machine data interfaces for plant operators



**Summary**

**For increased productivity and plant availability**



**PROFINET  
offers ...**

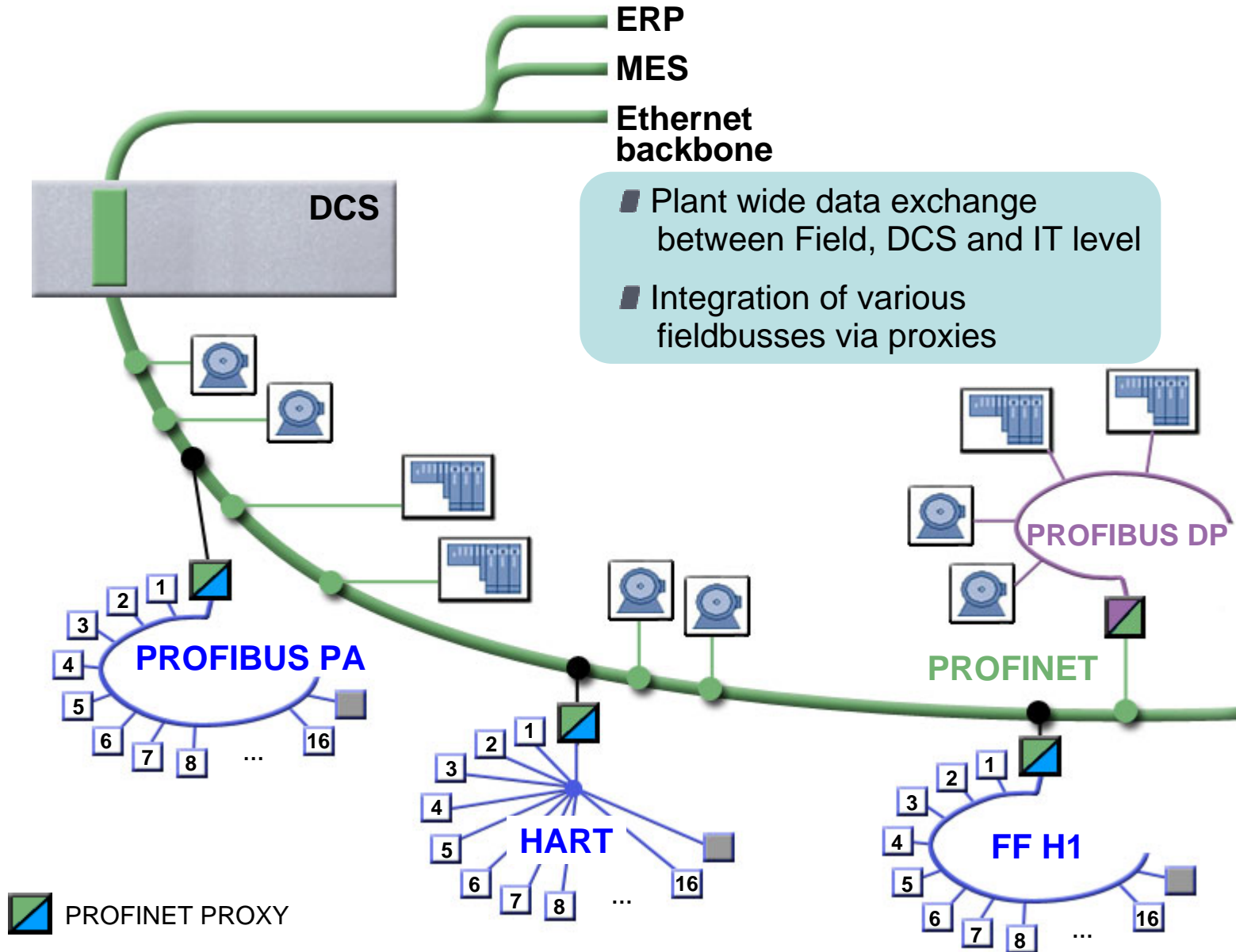
**... continuous  
enhancement**



Process  
industries



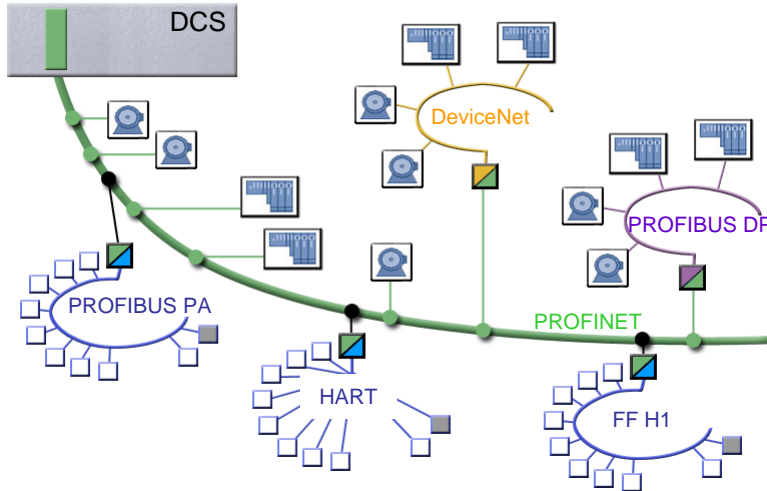
- Agenda
- Uniform structures
- Performance
- Integration
- Innovations
- Enhancement



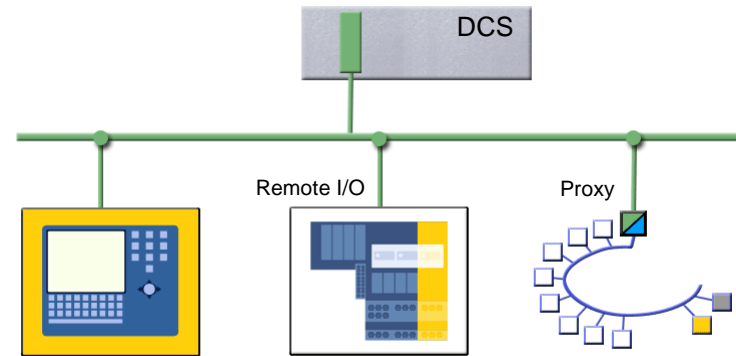
PROFINET PROXY

- Agenda
- Uniform structures
- Performance
- Integration
- Innovations
- Enhancement

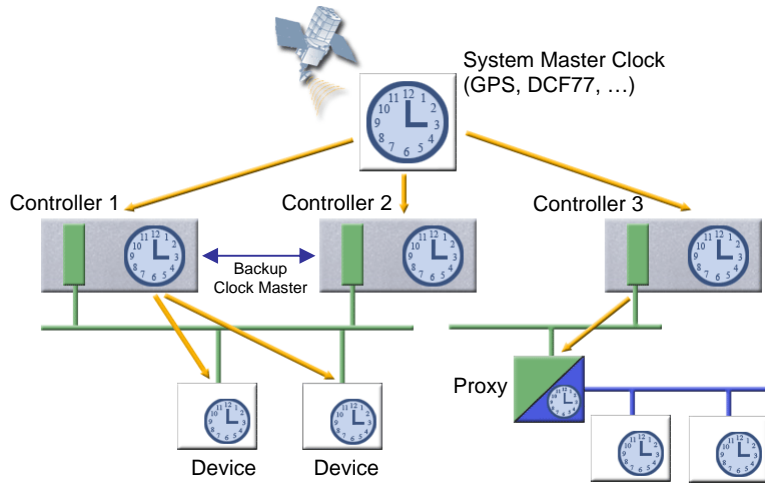
## Fieldbus integration



## Configuration in Run (CiR)

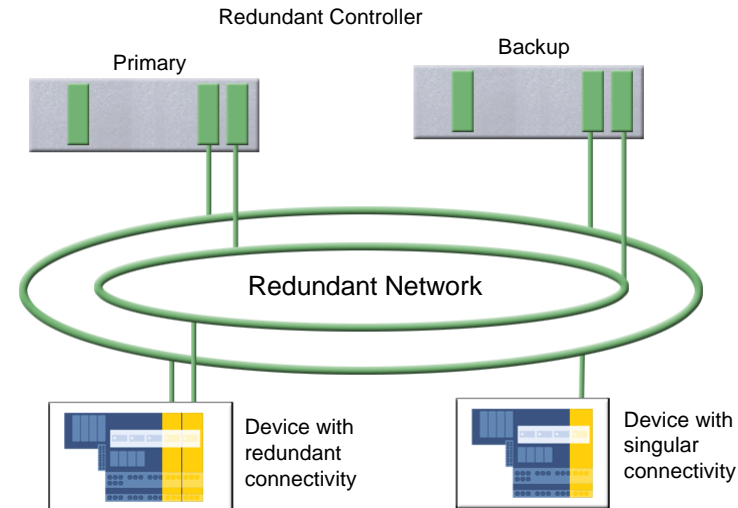


## Time sync / time stamping



PROFINET Marketing - Benefits

## Scalable Redundancy



**PROFINET  
offers ...**

**... continuous  
enhancement**



PROFlenergy

Agenda

Uniform structures

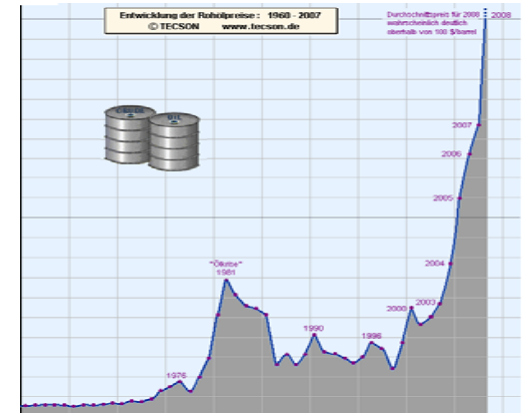
Performance

Integration

Innovations

Enhancement

- PROFINET is the first field bus worldwide with a standardized profile for efficient energy management.
- PROFINET is a synonym for innovation. Requirements from customer side are taken seriously and implemented very fast.
- PROFlenergy generates additional value to your products and safes your business in the long term.



**Use PROFlenergy, to save energy and costs!**

Agenda

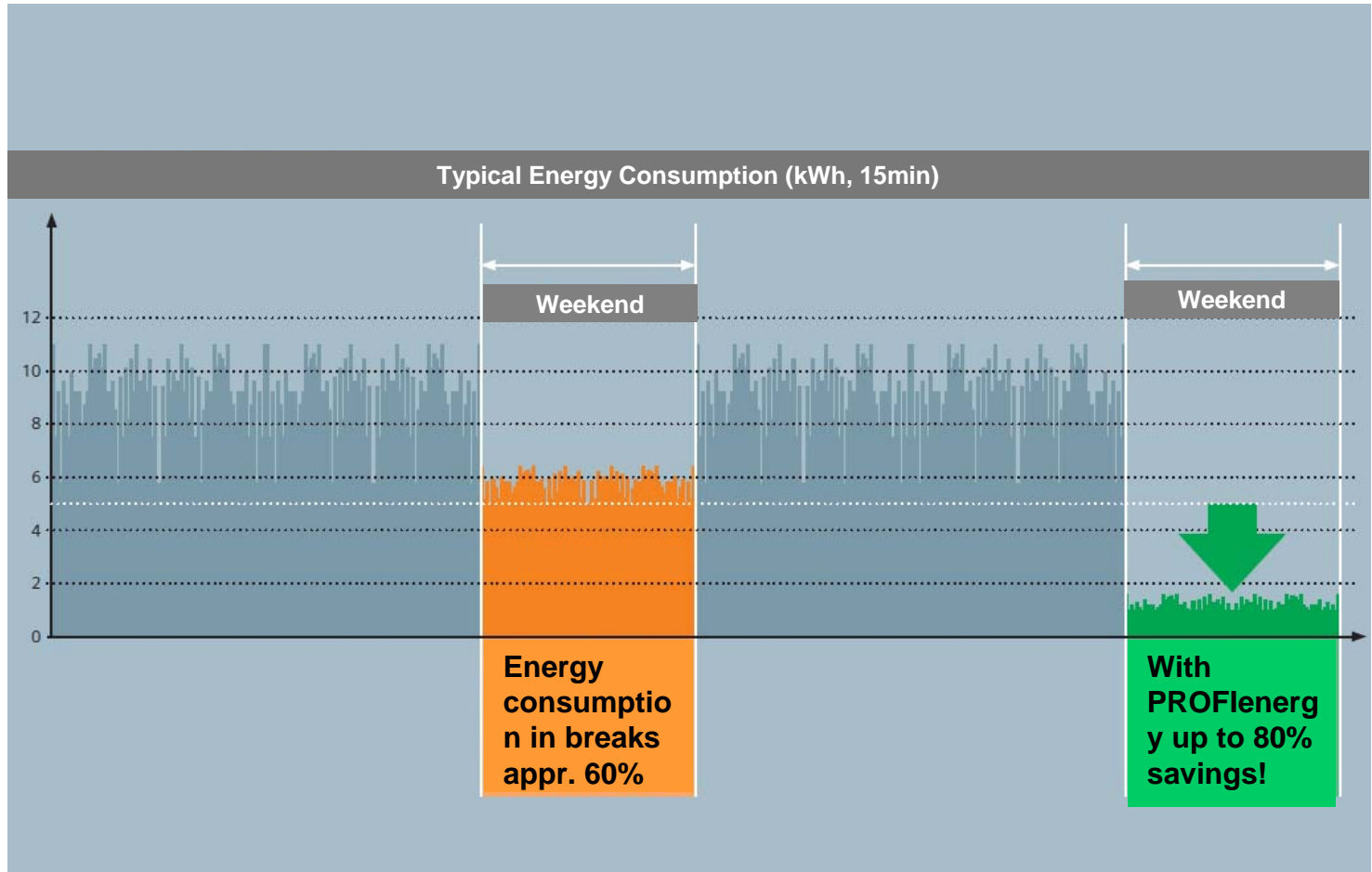
Uniform structures

Performance

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Enhancement



**Energy consumption during breaks appr. 60%!**

Agenda

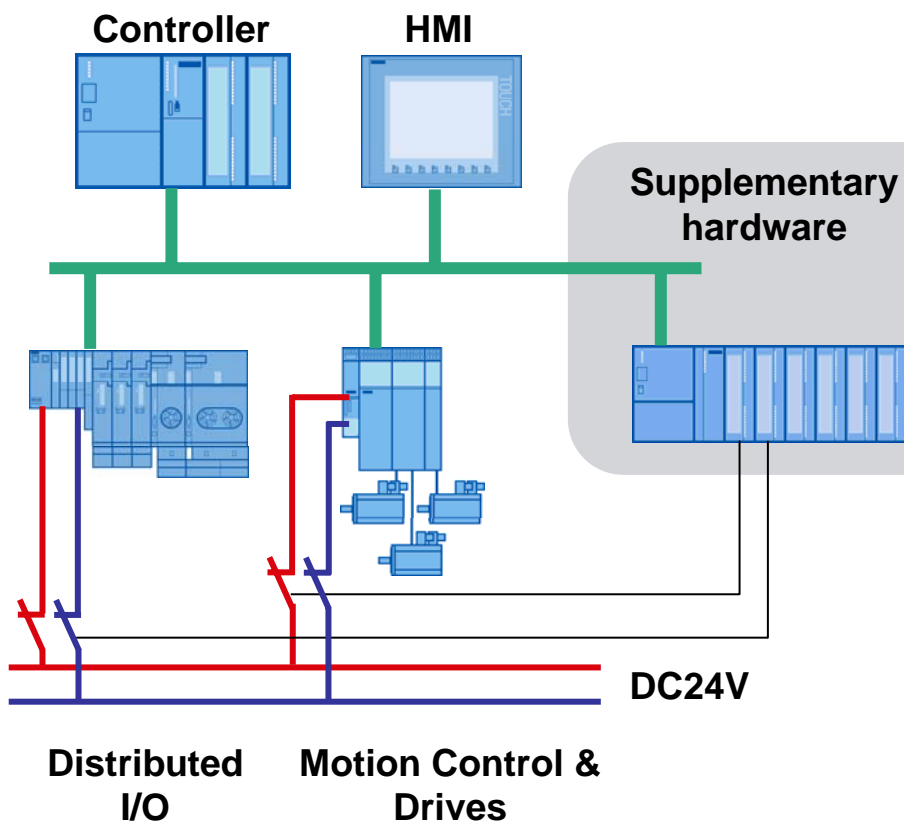
Uniform structures

Performance

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Innovations

Enhancement



## Manual switching:

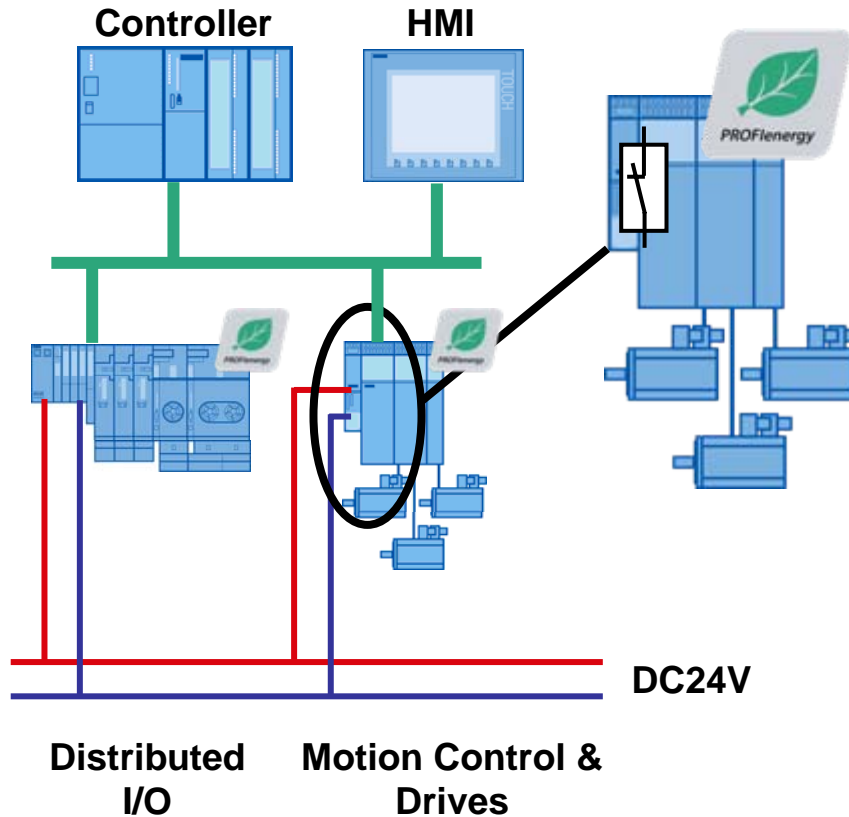
- Time-consuming
- Start-up unreliable
- Frequently only one main switch

## Use of external hardware

- Requires space and money
- Engineering and maintenance required
- Individual program

**Discrete solutions are rarely accepted.  
Saving potential during the breaks is not used.**

- Agenda
- Uniform structures
- Performance
- Integration
- Innovations
- Enhancement



**Cost savings** through omission of external hardware

**Energy saving** even in short pauses thanks to granular switching

**High system reliability** through coordinated switching

**Investment safeguarding** through simple reaction-free integration into existing standards

**Free selection of device** through vendor-independent standard

**PROFlenergy permits energy saving in breaks through switching-off of non-required loads!**

Agenda

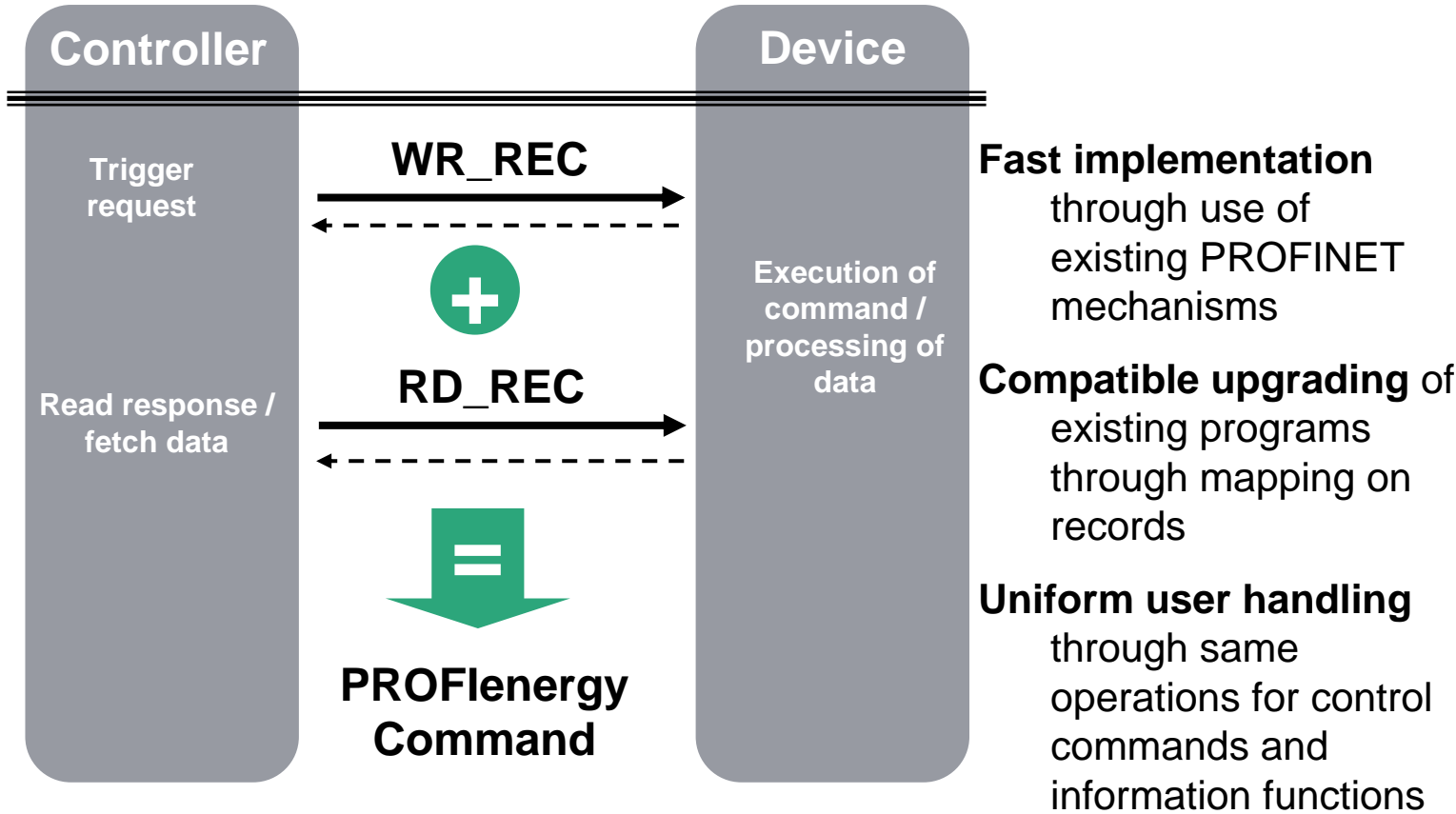
Uniform structures

Performance

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**System and device vendors offer corresponding blocks which conceal the protocol.**



Agenda

Uniform  
structures

Performance

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Enhancement



**Competitive advantage ...**  
... through marketing of low-energy machines



**Investment safeguarding ...**  
... through simple expansion of existing programs



**Low programming requirements ...**  
... through reloadable function blocks



**Fast commencement ...**  
... through integration into known product families and use of existing mechanisms



**Free choice of manufacturer and devices ...**  
... through manufacturer independent standard



**Environmental protection ...**  
... through lowering energy consumption and CO2 emissions

**More information**

Agenda  
Uniform structures  
Performance  
Integration  
Innovations  
Enhancement

## Internet

- [www.profinet.com](http://www.profinet.com)

## Flyer

- PROFINET Flyer
- PROFINET System description



## Support

- local PROFINET-Competence Center

## PI – Organization

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PROFIBUS & PROFINET International (PI)  
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[www.profibus.com](http://www.profibus.com) • [www.profinet.com](http://www.profinet.com)

PROFINET Marketing - Benefits

# Summary

## Agenda

Uniform structures  
Performance  
Integration  
Innovations  
Enhancement

## PROFINET offers ...

**... more continuity and uniform structures**

**... more nodes and better performance**

**... seamless integration of existing systems**

**... new, innovative applications**

**... continuous enhancements**

## Agenda

Uniform structures

Performance

Integration

Innovations

Enhancement



- The fieldbus based on Ethernet for all applications
- Covers the key markets and key technologies in automation – both today and in the future
- Supported by the greatest automation organization for communication solutions